ABSTRACT

Title of Document: A BENEFIT-COST ANALYSIS OF THE STUDENT SUPPORT SERVICES PROGRAM

Ed M. Pacchetti, Doctor of Philosophy, 2009

Dissertation Directed by: Jennifer K. Rice, Ph.D.

This study extends previous research on the Student Support Services program, a federal program that works to ensure college retention and graduation for low-income and first generation students, by examining the benefits and the costs of higher-impact SSS projects. Higher-impact SSS projects are defined as such because the graduation rates of their participants exceed the national graduation rate for other low-income and first generation students who have not participated in the SSS program.

Applying a methodology used in other benefit-cost analyses of education programs, this study explores how the benefits over 40 years following participation in higher-impact SSS projects exceed the costs of these projects. This study focuses on benefits and costs to society. The benefit measures utilized in this study include higher income, lower health care costs and lower costs of crime. The cost measures include grant award costs, institutional project contributions, Pell Grant costs and the costs of Stafford Loan subsidies.

The findings show that at three discount rates of 3%, 7% and 10%, the benefits of higher-impact SSS projects consistently exceed their costs. In addition, in most estimates

of the future value of benefits generated by higher-impact SSS projects, the benefits generated by these projects are significant enough to provide for the grant award costs of all SSS projects at 4-year colleges and universities in project year 2005-2006, the year that is the focus of this study.

This study's findings have implications for future research. Because the benefits of higher-impact SSS projects are significant, future research should focus on identifying the components of these projects responsible for success and incorporating these components into less successful projects in an attempt to increase the college graduation rates of all SSS projects. However, this study emphasizes that benefit-cost analysis should be one of many measures used to evaluate SSS projects and determine program success.

A BENEFIT-COST ANALYSIS OF THE

STUDENT SUPPORT SERVICES PROGRAM

by

Ed M. Pacchetti

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2009

Advisory Committee:

Professor Jennifer K. Rice, Chair
Professor Betty Malen
Professor Sharon Fries-Britt
Professor Marvin Titus
Dr. Jennifer Engle

DEDICATION

For my Mom~

Who always wanted me to have the educational opportunities that she never did.

ACKNOWLEDGEMENTS

When Hillary Clinton expressed the sentiment “it takes a village”, she was talking about my dissertation process. Behind my completion lies a whole community that has pushed me towards the finish line. First, to Raymond, you have been with me the whole time. From pressuring me to get my application to the Ph.D. program submitted, to reformatting all of my tables, to doing a final chart for this document, I truly could not have done it without you. Your love and support, your technical expertise, your attempts to curb my social schedule so that I could finish the dissertation and your constant encouragement to keep working towards this goal were irreplaceable.

To my brothers who always asked, “When the heck you going to finish that thing?” I appreciate your support through this whole process. You are such significant parts of my life and I can’t imagine my life without both of you in it on a regular basis. Mom’s lasting legacy is the close friendship that we share.

To my Dad, who may not have understood this whole process, but never stopped encouraging me to finish and upon my completion, asked me “What’s Up Doc?”, I appreciate your support and look forward to having you and Donna join me for my graduation ceremony. If you had not worked so hard to pay for my four years of college at Illinois Wesleyan University, I would not be writing this today.

This dissertation would not have been completed without my favorite writing partner, Nonna. The times I spent writing at your house, and the coffee and danish we shared are among my best and most treasured memories from this entire process. I love you more than you could know, and I want you to know that you are the best

grandmother the world has ever known. My thanks also to Dena for offering breaks from my writing whenever she would arrive, and for always making me laugh. My thanks as well to Ronnie, Jason, Justin and their families. I have always felt so lucky to have such a supportive family around me.

Special thanks and thoughts go to my Aunt Jean. She never stopped telling me how proud my Mom would be of me, and she selflessly cared for my grandparents following my mother's death. Whenever I'm really missing Mom, I just pick up the phone to call Jean and I feel better immediately. Also, special thanks to Shelly, who inspires me everyday with her ability to put herself through school, work full-time and be one of the best mothers around. You got it goin' on, girl!

In DC, I had a special support team as well. First of all my two editors, Noel Coleman and Georgeann Higgins. You both added so much to the quality of this dissertation. You both made me sound smarter than I am! Noel, our Thursday night's at Saint Ex offered a respite from work, and if I was as good at meeting deadlines as you are, I would have finished this long ago. GA, our trips to the cabin and our nights at Annie's always provided good times, and your hard questions about my dissertation added depth to my arguments! Thanks to you both.

I also had three angels here in DC that helped me to finish this dissertation. First is Patricia Steele, who served as my writing partner for several years, and over that time, we forged a very close friendship. I'll never forget our conversations. You and Doug helped me to think through many tough questions as I constructed my dissertation proposal. Second, is Jeanne Bayer Contardo. We formed a little writing group of our own and your prodding, your careful reading of my whole dissertation before my

defense, and your eternal positive attitude and encouragement were significant, and I'm so glad and so proud to call you my friend. Third is the President and CEO of the Institute for Higher Education Policy, Michelle Asha Cooper. Michelle, you inspire me just by being who you are, and your advice throughout the process, especially at the end, gave the confidence to go into my dissertation defense knowing that I could do it.

I also thank my committee, Jennifer Rice, Betty Malen, Sharon Fries-Britt, Marvin Titus and Jennifer Engle. Jennifer (Rice) and Betty have been with me since the beginning, and I have learned so much about life and about myself just from my conversations with them. In addition, I count myself lucky to have gotten to know Sharon and Marvin through this process, and Jennifer's (Engle) expertise around TRIO programs was critical to informing the methodology I used in this dissertation.

To my housemates, Darrin, Donald, Eric, and John, thanks for putting up with me writing all of the time, and for my lack of housework during this very busy time. You are not only my housemates, you are my friends and I am so lucky to have each of you in my life. As well, thanks to my work colleagues who have been so encouraging through this entire process. Thanks to Bob Lewis for your support of me and my finishing the dissertation. Your friendship means a great deal to me. Also, thanks to Diana Hayman, who brought me to the Department of Education and continues to offer welcome guidance and support. You rock! As well, thanks to Janie, Nalini, Don, Brandon, Pamela, and to Jessica and Jeff. Jessica Barrett Simpson inspires me to be more than I think I can be, and she can drink me under the table.

I would be remiss if I did not mention the significant contribution of John Clement. John was my advisor throughout the proposal and the dissertation writing

process, and whenever I faced a problem that I thought was insurmountable, John would convince me that it was not. I loved talking with him just to watch his mind work. He's brilliant. Also, thanks to my little dog, Rocky, who was often my writing companion. I couldn't ask for a better pet than Rocky-dog.

Finally, thanks to my four greatest sources of inspiration – Peyten, Shelby, Brooke and Ashlyn. You four girls never fail to bring a smile to my face and when I think about the work I do to increase access to college in this country, I do it for the four of you, so that hopefully I leave behind a world that is a little better than the one I found. I will always be here for the four of you, and one of the most exciting things about life is watching the four of you grow up. The four of you always remind me, in your own little ways, of what is really important.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

CHAPTER 1

Introduction

Higher education has long been an important contributing factor to an individual's economic success. Its importance is only increasing as the gap between the earnings of high school and college graduates continues to increase (Levin, Belfield, Muennig & Rouse, 2006). During their working lives, on average, college graduates make significantly more money than high school graduates. In 2005, the average full-time worker with a 4-year degree earned $50,900, 62% more than the $31,500 earned by the average full-time worker with just a high school diploma (Baum & Ma, 2007). Due in part to these labor market realities, a growing percentage of Americans include a college education among their life's goals. Between 1995 and 2005, college enrollment increased for high school graduates from every income category (Baum & Ma, 2007).

However, current rates of increase in college enrollment are not sufficient to meet future needs. The United States "will need to produce 15.6 million more Bachelor's and Associate's degrees beyond currently expected levels – 781,000 additional degrees per year between now and 2025, an increase of 37 percent over the current pace of degree production" (Reindl, 2007, p.5). Failure to do this will "lead to a drop in the average level of education of the U.S. workforce over the next two decades" (National Center for Public Policy and Higher Education, 2005, p.1), and "will wreak economic and social

havoc on the quality of life for all Americans, in addition to lowering the collective standard of living and placing the nation at a serious competitive disadvantage" (Hoyle & Kutka, 2008, p. 355). The economic health of the United States depends on a work force of skilled labor; if more is not done to ensure college access and success, the economy of our country will decline (Kirsch, Braun, Yamamoto & Sum, 2007).

The need for greater college degree attainment has led to increases in college enrollment and graduation. However, the increases in college enrollment and graduation have differed greatly based on family income. The path from gaining admission to college to graduating is especially fraught with obstacles for students from low-income families. Only 26% of college students whose families are from the bottom income quartile (family income below $38,600 as defined by the U.S. Census Bureau's Current Population Survey) complete a bachelor's degree by age 24. In contrast, over 89% of those from the top income quartile (family income above $105,800) complete a bachelor's degree by age 24 (Mortenson, June 2008).

Obstacles for first generation students, defined as students for whom neither parent graduated from college, are greater than for students who have a parent who is a college graduate. In a 2005 study conducted by the U.S. Department of Education's National Center for Education Statistics, only 24% of first generation students who were 12^{th} graders in 1992 and who enrolled in postsecondary education between 1992 and 2000 completed a bachelor's degree by the year 2000. In contrast, of those 12^{th} graders whose parents were college graduates, 68% completed a bachelor's degree (Jaschik, 2005). For students who are both low-income and first generation (LIFG) students, the graduation rate with a bachelor's degree is a meager 11% (Engle & Tinto, 2008).

To help increase the graduation rates of LIFG college students, the Department of Education has created a number of programs. One of those programs, the Student Support Services (SSS) program, operates on nearly 1,000 college and university campuses across the country and is designed to help students successfully navigate pathways that lead to retention from one academic year to the next and, ultimately, to graduation from college.

The Department of Education initially funded SSS grants in 1971 with a threefold mission to (1) "increase college retention and graduation rates for eligible students; (2) increase the transfer rates of eligible students from 2-year to 4-year institutions; and (3) foster an institutional climate supportive of the success of LIFG college students and individuals with disabilities" (Section 402D Higher Education Act of 1965, 20 U.S.C. 1070a-14). Students eligible for SSS programs must be enrolled in a college or university receiving a SSS grant; and two-thirds of the students must be low-income individuals who are also first generation college students, or students with disabilities. The remaining one-third of students in any SSS project must be low-income students, first generation students, or individuals with disabilities (Section 402D Higher Education Act of 1965, 20 U.S.C. 1070a-14). In SSS project year 2003-04, the percentage distribution of SSS participants by eligibility status is as follows:

Table 1
Percentage Distribution of SSS Participants, by Eligibility Status, 2003-2004 at SSS Projects at 4-Year Colleges and Universities

Low-Income and First Generation	62.5 %
First-Generation Only	17.0%
Low-Income Only	8.2%
Disabled Only	6.4%
Low-Income and Disabled	5.3%
Total – All SSS Participants at 4-Year Institutions	**99.4%***

*does not equal 100% due to rounding.
Source: U.S. Department of Education (2007), An Interim Report on the Student Support Services Program: 2002-2003 and 2003-2004, with select data from 1998-2002.

While Table 1 illustrates that several different groups of students are eligible to participate in SSS, the majority of SSS participants are LIFG students, and these students are the primary focus of the SSS programs. However, all categories of SSS participants have lower postsecondary education completion rates than students who are not eligible for SSS, including students who are only low-income, students who are only first generation, and students who have disabilities, both low-income and not low-income (Murray, Goldstein, Nourse & Edgar, 2005; U.S. Department of Education, 2008). Students with disabilities comprise just over 10% of the SSS population, and are not a primary focus of the vast majority of SSS projects; only 15 SSS projects at 4-year institutions focus primarily on disabled students (SSS APR Data, 2005).

Because the LIFG population continues to grow, access and success in college for this group is relevant to lawmakers and policymakers in the United States and SSS is one of the only federal grant programs that focuses on LIFG students. While this study recognizes that the SSS population of participants encompasses all of the groups

mentioned in Table 1, this study focuses on LIFG students and uses comparisons of graduation rates between SSS participants and other LIFG students.

SSS programs strive to increase the retention rates and graduation rates of low-income, first generation college students, and students with disabilities. By offering services such as tutoring, counseling, academic and financial aid advising, and peer mentoring, SSS has been increasingly successful in working with these populations of students (Chaney, Muraskin, Cahalan & Rak, 1997; Muraskin, 1997). A survey of 5,800 students attending 47 higher education institutions, in which half of the students surveyed participated in SSS and half were a matched comparison group, indicated that peer tutoring, cultural events, workshops and instructional courses were effective methods for increasing grade point average (GPA), the number of credits earned and retention rates for SSS participants (Chaney et al., 1997, Muraskin, 1997).

In addition, SSS projects are now allowed to use up to 20% of their grant funds to provide grant aid for their participants. This additional financial aid can make a critical difference for low-income students. For students who are eligible for financial aid, receiving greater amounts of aid that cover a higher percentage of students' actual costs increases the likelihood of persistence and graduation (Alon, 2003). In a study conducted by the Department of Education of nine SSS sites, eight of the nine projects provided grants and/or scholarships ranging from "$400 to several thousand dollars per student" (U.S. Department of Education, 2008, p. 37). In addition, a SSS study completed in 1997 found that over half of the former SSS participants surveyed indicated that "not enough money was a significant factor in leaving" when asked why they were not enrolled in the third year of college (Muraskin, 1997, p. 7).

SSS projects have proliferated on campuses since their introduction nearly 40 years ago. In fiscal year (FY) 2005, the federal government funded SSS projects at 935 colleges and universities serving over 200,000 college students across the United States and in Puerto Rico. The average institutional award in 2005 was $284,799 and the average amount per program participant was $1,351 (U.S. Department of Education, 2006). The U.S. Department of Education awarded just over $1 billion to the SSS program between 2004 and 2008, making it the largest single grant program in the Office of Postsecondary Education (U.S. Department of Education, 2008b). One might expect that a program of this magnitude and longevity would at some point have been the subject of a benefit-cost analysis. However, although the federal government has funded the SSS program since 1971, no known researcher has conducted an analysis of the program's benefits and costs. Thus, such an analysis will add to existing literature about the SSS program and assist policymakers with fund allocation decisions. This study analyzes the benefits and costs of higher-impact SSS projects at 4-year colleges and universities across the United States and explores whether the program's costs exceed its benefits at these institutions. SSS projects defined as higher-impact all have above average graduation rates for LIFG students.

Overview of Existing Research

While SSS has not been the subject of a benefit-cost analysis, SSS has been the subject of several other types of studies and evaluations since its inception in the early 1970s. Research has consisted of national surveys of SSS that consisted of an overview of the SSS program and the results of case studies on program services, policies and

programs (Cahalan, Muraskin & Goodwin, 1994; Chaney, Muraskin, Cahalan & Goodwin, 1998; Chaney, Muraskin, Cahalan & Rak, 1997, Zhang & Chan, 2007), individual evaluations of SSS projects on college and university campuses (Bailey, 2005; Boughan, 1996; Burkheimer & Davis, 1973; Coulson & Bradford, 1983; Mahoney, 1998; Pinkston-McGee, 1990; Read, 1982; Thomas, Farrow & Martinez, 1998; Walsh, 2000), and profiles of SSS projects based on information collected from Annual Performance Reports (APRs) submitted by each SSS project director (Carey, Cahalan, Cunningham & Agufa, 2004; Zhang & Chan, 2007; Zhang, Chan, Hale, & Kirshstein, 2005).

Several studies compare SSS participant retention and graduation rates with students not enrolled in the SSS program using a quasi-experimental methodology. These analyses are not as reliable as studies performed using randomized experimental design, with students randomly assigned either to a control group (non-SSS participants) or a treatment group (SSS participants). However, no such experimental studies of SSS exist because individual projects do not assemble a control group of LIFG non-SSS participants with whom to compare performance on key outcomes such as retention and graduation. In 2007, the Federal TRIO office attempted to conduct an evaluation of Upward Bound that required Upward Bound grantees to enroll twice the number of eligible students and assign half of them to a control group (Field, 2008). While this would have provided a matched-comparison with which to compare student outcomes, the Department of Education agreed to terminate the evaluation due to intense pressure from lobbyists employed by the Council for Opportunity in Education and from members of Congress. Arnold Mitchem, President of the Council for Opportunity in Education

decried the study as "treating kids as widgets" adding that "these are low-income, working class children that have value, they're not just numbers" (Field, 2008, p. 26).

In addition to a lack of studies based on random assignment, the extant studies lack control over the effect of external variables, such as other campus programs that offer tutoring, personal counseling, and remedial courses. These variables may supplement the services offered by SSS, and they have an unknown effect on student performance. However, there is no politically viable avenue for requiring students to engage only in SSS-provided services in order to get an accurate measure of the effect of those services in isolation. This lack of control over external variables limits the specificity of the measures of SSS project effects on participant outcomes such as retention, GPA, and graduation rates. In the absence of an experimental environment, using a matched comparison group provides the closest approximation of the effects of the SSS program currently available in research literature.

In addition, program implementation is not uniform across SSS project sites. While SSS rules and regulations provide a list of services that may be offered, none of the services on the list is "required," which greatly reduces any consistency from project to project. Each SSS project director constructs his or her program by offering a menu consisting of any of the services allowed in the authorizing legislation of the SSS program. In addition, the degree of integration of a SSS project on each campus differs greatly. Some campuses have SSS projects that are an integrated part of the student services they offer, while other campuses host SSS projects that are much more segregated from services offered by the college or university. In addition, different campuses offer different levels of support to the SSS project. Some project directors note

that, " For success, you need buy-in from the top. You need to know that the chancellor backs your program. And I think that's one of the reasons that our program works on this campus" (U.S. Department of Education, 2008, p. 51). Others note the value of programs such as tutoring when they state that, "The one thing that students like is you have this one designated tutor that's your tutor… versus the other system where you walk in and see whoever's available" (U.S. Department of Education, 2008, p. 46).

Another key difference in SSS projects is the tenure of SSS project directors. One SSS study indicated that "the tenure of project directors plays an important role in linking the projects to their institutions" (Muraskin, 1997, p. 36) and a study of five exemplary sites indicated, "institutional officials interviewed for this study express admiration for the [SSS] projects and appear to value them highly… the project directors are highly respected." (Muraskin, 1997, p. 37). These differences, and others, result in differences in implementation of the SSS program across different campuses.

In the majority of studies of the SSS program, as well as studies of individual SSS projects on college and university campuses, the effects of SSS on student GPAs, credits earned, retention and graduation rates have been positive (Cahalan et al., 1994; Chaney et al., 1997; Muraskin, 1997; Carey et al., 2004; Zhang & Chan, 2007). Research on specific SSS projects has consistently found a strong correlation between SSS participation and increased retention and graduation rates (Bailey, 2005; Boughan, 1996; Burkheimer & Davis, 1973; Coulson & Bradford, 1983; Mahoney, 1998; Pinkston-McGee, 1990; Read, 1982; Thomas, Farrow & Martinez, 1998; Henry, 1999, Walsh, 2000, Mahan, 2001). Some studies have found that retention and graduation rates for SSS participants are only slightly lower than for the student body of the institution

(Thomas et al., 1998; Mahoney, 1998). This finding is significant because, in most cases, the retention and graduation rates of LIFG college students are much lower than for other students who come from higher-income backgrounds and have parents who are college graduates. Other studies have found that SSS participants had higher graduation rates than students not involved in the SSS program, who in some cases are higher income students (Henry, 1999; Walsh, 2000; Mahan, 2001; Bailey, 2005).

Several other studies compared SSS participants to students who qualified for the SSS program, yet did not participate (i.e., students were also low-income and/or first generation or students with disabilities). These studies found that (1) a higher percentage of SSS students stayed in school and completed more credits than did similar students who did not receive SSS services (Read, 1982; Pinkston-McGee, 1990; Boughan, 1996) and (2) SSS participants were more likely than non-participants to complete their freshman year (Chaney et al., 1998).

Two studies compared SSS participants with one comparison group of eligible non-participants and one group of non-eligible students. One of these studies found that the non-eligible student group had the highest 6-year graduation rate, followed by SSS participants, and then by SSS-eligible non-participants (Bailey, 2005); another study found that SSS participants had higher retention and graduation rates than SSS-eligible students and non-SSS eligible students (Mahoney, 1998).

A review of prior research did not identify any studies that demonstrated that the SSS program had a negative effect on retention rates, graduation rates, or credits earned while in college. However, some research does suggest that an individual SSS project can have very limited effects on graduation rates.

While several studies of individual SSS projects point to increased graduation rates due to SSS, (Mahoney, 1998; Henry, 1999; Walsh, 2000; Mahan, 2001; Bailey, 2005) even if the effect is small, recent nationwide data taken from a compilation of all SSS project APRs suggest a much stronger relationship between SSS and college graduation rates. This is most evident at select higher-impact SSS projects that have graduation rates above the average graduation rate of 34.1% for LIFG students who enroll at 4-year colleges and universities and complete a bachelor's degree at their original institution within 6 years (BPS: 96/01). Out of the total 360 SSS projects that have six-year graduation rate data and are hosted at 4-year institutions, a total of 164 of these projects have graduation rates of at least 36.6%, which is 2.5 percentage points above the LIFG average graduation rate of 34.1% (BPS, 96/01). These projects are termed "higher-impact" projects for the purposes of this study.

Purpose of This Study

Previous studies of the SSS program have provided evidence of a correlation between SSS participation and higher GPAs, retention rates, and graduation rates; but, these studies (Pinkston-McGee, 1990; Cahalan et al., 1994; Chaney et al., 1997; Chaney et al., 1998; Mahoney, 1998; Thomas et al., 1998; Walsh, 2000, Carey et al., 2004; Zhang et al., 2005; Bailey, 2005; Zhang & Chan, 2007) do not determine if the monetary benefits of the program exceed its costs. This study extends prior research about the effectiveness of the SSS program by conducting a benefit-cost analysis of higher-impact SSS projects. A benefit-cost analysis provides information on the monetary value of

benefits and costs of the SSS program that policymakers can use as one criterion for making decisions about the appropriation of federal funds.

The purpose of this study is to answer the following research question:

Do the monetary benefits to society of the SSS program exceed its costs for select higher-impact SSS projects at 4-year colleges and universities across the United States?

The benefits measured in this study are financial benefits such as higher tax receipts, lower healthcare costs and lower costs of crime that accrue to society as a result of a higher percentage of SSS participants in higher-impact projects receiving bachelor's degrees, as compared to graduation rates for other LIFG college students who do not participate in such SSS projects. The difference in graduation rates between SSS participants at these higher-impact SSS projects and non-participants are used to calculate the monetary societal benefits associated with the SSS program.

Although SSS participation is correlated with increased college persistence rates, the economic benefits of persisting in college, but not graduating, are not included in this study. The financial benefits of completing some college are much lower than the benefits that one accrues after completing a bachelor's degree (Baum & Ma, 2007; Mortenson, June 2008). Overall, the economic benefit (or average rate of return) to another year of schooling is estimated at 10% (Psacharopoulos & Patrinos, 2002) but achieving the credential of a bachelor's degree may ultimately have more of an effect on

earnings due to the "sheepskin effect" which is what many analysts call the wage premium placed not just on completing a set number of years of school, but of receiving a bachelor's degree (Goodman, 1979; Card, 1999).

There are many benefits that result from the SSS projects that are the focus of this study. Some of these benefits are benefits to society that are included in this study, such as higher federal income taxes collected, lower costs of incarceration and lower Medicaid costs. However, several societal benefits of these SSS projects are not included as benefit measures in this benefit-cost analysis. These include increased property taxes, increased state and local income taxes, other costs of crime in addition to incarceration, and decreased health care costs due to reduced smoking and increased exercise that regularly accompany higher education. In addition, there are private benefits to SSS that are not included in this benefit-cost analysis because this analysis focuses only on the benefits and costs to society. However, benefit measures would assuredly be much higher if this analysis included the positive effects on the individual of increased income due to greater educational attainment, increased health and other benefits such as increased civic involvement. Other benefit-cost analyses include some of these items, and those analyses are discussed in detail in the literature review contained in Chapter 2.

Discount Rates in Benefit-Cost Analysis

To accurately measure benefits and costs occurring at different points in time, a program's benefit and cost measures must be converted to a common monetary base by adjusting them to their present values, which for the purpose of this study are expressed in 2005 dollars (Rossi, Lipsey & Freeman, 2004). The fundamental idea behind a

discount rate is that costs occurring in the future are less of a burden than costs occurring in the present since a dollar spent today is not the same as a dollar spent 15 years from now (Cohen, 1998). For example, if Project A spends $1,000 in year 1, and Project B spends $1,000 in year 2, Project A would be deemed more costly because Project B could invest its $1,000 to earn a return elsewhere during year 1 (Levin & McEwan, 2001). The same theory holds for benefits. One hundred dollars received today is much more valuable than $100 received 10 years from now because the $100 received today can be invested to earn a return for the next 10 years.

To calculate the value of future benefits and costs, economists apply a rate that discounts costs and earnings in the future (Levin & McEwan, 2001). While a discount rate of 3.5% is most common, discount rates of between 0% and 10% are generally used in research (Levin & McEwan, 2001; Moore, 2004; Belfield, Nores, Barnett & Schweinhart, 2006; Belfield & Levin, 2007).

A discount rate is important when conducting a benefit-cost analysis of the higher-impact SSS projects because the projects involve expenditures today but yield benefits over the entire 40-year working life of a participating graduate due to the higher bachelor's degree completion rates that are correlated with the participation in these SSS projects. Therefore, future benefits must be discounted when comparing them to costs that are accrued today. Costs are discounted by using the formula:

$$\text{Present Value} = \frac{\text{Amount}}{(1 + r)^t}$$

In the formula, r is the discount rate and t is the number of years. For each year of the SSS benefit-cost analysis, the value of the costs or benefits in present value is added up to produce a discounted value of benefits and costs, and it is these two numbers that are the numerator (benefits) and the denominator (costs) of the benefit-cost ratio. Thus, using the example of $1,000 above with a discount rate of 10%, in Year 1, that $1,000 would be reduced to $909.00 by dividing it by $(1 + 10)^1$ in Year 2 it would be reduced to $826.45 by dividing $1,000 by $(1 + 10)^2$ and so on. The exact calculations using the discount rate formula above are contained in Appendix B.

In sum, the discount rate adjusts benefits in the future for the effects of inflation, turning them into constant dollars by converting the benefits to their net present value. The discount rate also accounts for the opportunity cost of not being able to invest benefits earned to produce a yield from the monetary benefit (Rossi et al., 2004). This benefit-cost analysis of higher-impact SSS projects is conducted using discount rates of 3%, 7% and 10% to provide for a number of assumptions about the value of benefits and costs over time. In practice, several different discount rates are often used because there is much uncertainty over the choosing of a discount rate.

The uncertainty about choosing a discount rate occurs because there is often much disagreement about the yield that an investment might earn, or the inflation rate that will most closely mirror future economic conditions. This can make the choice of a discount rate somewhat controversial (Sinden, 1980; Rossi et al., 2004). A discount rate of 7% has been chosen as the middle rate in this analysis because it is this rate that the Office of Management and Budget (OMB) recommends be used to report the net present value of benefits and costs when evaluating federal programs (OMB Circular A-94). However,

this recommended discount rate has not been consistent over time. In the 1970s and 1980s, OMB required most government agencies to use a discount rate of 10% (OMB, 1972) and currently the General Accounting Office and the Congressional Budget Office both use discount rates below the current OMB recommended rate of 7% (Moore, Boardman, Vining, Weimer, & Greenberg, 2004).

Using three discount rates will account for many different assumptions about the future value of money. This is important because if only one discount rate were used, and the benefits outweighed the costs, policymakers or lawmakers might choose to reallocate funding (either more or less) based on a benefit-cost analysis that was conducted under only one set of assumptions about the future value of money. By using three different rates in this study, policymakers and lawmakers will be able to view the benefits and costs of the program under different assumptions about the future value of money, and then decide which set of assumptions he or she most thinks is the best proxy for the future (Moore et al., 2004).

In addition, the highest discount rate used in this study, 10%, is the highest discount rate that has been recommended for use by the OMB in the past 30 years (OMB Circular A-94). Based on the literature review of cost analyses in education, no education program cost analyses have employed discount rates higher than 10%, and many have employed discount rates that were lower. Therefore, including a discount rate of 10% should encompass dire projections of the future value of money because the higher the discount rate, the less that future benefits and costs are worth in current dollars, and the more conservative the estimate (Moore et al., 2004; Belfield & Levin, 2007).

Finally, because benefits are measured over a length of 40 years, a higher discount rate substantially decreases the value of the benefits measures in this study while not affecting the costs measure at all because benefits and costs are expressed in 2005 dollars (Cohen, 1998). Therefore, by using a relatively high discount rate of 10%, the value of benefits at this upper discount rate is substantially less than the value of those benefits were they paid out today. However, it is only through a comparison of the net present value of benefits and costs that we are able to accurately compare the value of benefits and costs occurring in different time periods through conversion to a common unit of measurement (OMB Circular A-94).

Model Benefit-Cost Analysis Framework for the Study

This study builds on the theoretical and conceptual framework laid out in several benefit-cost analyses of preschool programs (Reynolds, Temple, Robertson & Mann, 2002; Barnett & Masse, 2007; Belfield et al., 2006). While it may seem counterintuitive to use a methodology from a benefit-cost analysis of a preschool program to conduct a benefit-cost analysis of a postsecondary education program, some of the most sophisticated benefit-cost analyses within education are analyses of preschool programs, and thus are used as models for this benefit-cost analysis.

The first, and perhaps most well known, of these studies is the benefit-cost analysis of the Perry Preschool Project. This project was an intensive intervention delivered to pre-school children in Ypsilanti, Michigan, in the early 1960s. The children participating were randomly assigned to a treatment group or a control group, and,

because the study was longitudinal and conducted in the early 1960's, benefit measures have been collected for participants who are now over 40 years old.

Benefit measures used in the Perry Preschool Program include outcomes such as higher educational attainment, higher earnings, decreased criminal activity, and a decrease in the receipt of welfare benefits (Nores et al., 2005). Researchers compared the monetary value of these benefits to financial costs such as staff, facilities, and volunteer time required to run the program. The Perry Preschool Program study rendered both the benefits and costs of the program in monetary terms and calculated the net present value of the program for participants and for society. The study found that the monetary benefits of the Perry Preschool Program exceeded its financial costs, even when using a range of discount rates.

A similar benefit-cost analysis was conducted on the Abecedarian Program, a preschool program that provided intensive education through full-day childcare in the 1970s. Researchers obtained data through a random sample of 104 participants and continued follow-up through age 21 (Barnett & Masse, 2007). Similar to the Perry program, this program produced benefits that exceeded costs using a variety of discount rates. In addition to using several discount rates, the Abecedarian program used several benefit measures, including increased maternal earnings, decreased K-12 schooling costs due to fewer special education placements, increased lifetime earnings, and decreased costs associated with smoking (Barnett & Masse, 2007).

Researchers in Chicago, Illinois conducted a third benefit-cost analysis, this one of Title I Chicago Child-Parent Centers. Benefit measures included in this analysis were increased lifetime earnings (which led to increased federal and state tax revenues and

reduced public expenditures for remedial education), and reduced juvenile arrests, criminal justice treatment costs, and expenditures to crime victims (Reynolds et al., 2002). Cost measures for the CPC program included all expenditures for staff, family and community support, administration, operations and maintenance, instructional materials and transportation, as well as school-wide services and school district support (Reynolds et al., 2002).

Using a cohort of 1,539 program and comparison-group children born in 1980, a cost analysis of the program concluded that CPC's preschool program, the school age program, and the extended intervention program all yielded benefits that exceeded their costs. This benefit-cost analysis was different from those previously listed because it was conducted based on various lengths of attendance in the programs, making it possible to determine benefits and cost measures for participants who were part of the program for varying lengths of time. In addition, because the programs were different in nature, they each had different cost structures. The benefits of the preschool program were the highest, followed by the benefits of the extended program; the program with the lowest measure of benefits to costs was the school age program.

A fourth benefit-cost analysis, conducted by Clive Belfield and Henry Levin, used economic analyses conducted by several authors to calculate the public savings from various interventions aimed at increasing high school graduation rates (Belfield & Levin, 2007). By calculating the additional taxes high school graduates pay (compared to high school dropouts) the savings in government healthcare costs, the savings to the criminal justice system, and reductions in welfare payments, Belfield and Levin compared these benefit measures to the public costs of five intervention programs that were shown to

raise the rate of high school graduation. Each of the intervention programs examined by Belfield and Levin produced benefits that exceeded their costs.

For each of the studies discussed, the factor(s) producing an economic benefit varied by program, with the economic benefit of lower crime being substantial in the Perry Preschool analysis (Nores et al., 2005) but relatively small in the study of the Abecedarian intervention (Barnett & Masse, 2007). In the case of the Chicago Child-Parent Centers benefit-cost analysis, the benefit was spread more evenly across the benefit measures of increased lifetime earnings and tax revenues, reductions in school remedial services and reduced crime costs (Reynolds et al., 2002). However, while the value of benefit measures varied according to the study, these programs all demonstrated an economic benefit from investing in educational intervention programs involving preschool aged children and, in the case of Belfield and Levin, high school-aged children. All of these studies, by conducting similar benefit-cost analyses, lay the foundation through their methodologies, for discovering if similar economic benefits exist for higher-impact SSS projects.

Research Method

To conduct a benefit-cost analysis of higher-impact SSS projects, it is necessary to construct benefit and cost measures. Because SSS is a federal program, and the majority of the costs of the program are funded with federal tax dollars, this study measures societal benefits and costs of the program. A measure of societal economic benefits is one criterion that can help policymakers to determine if the return on the investment of federal funds to society warrants continued funding of a program. The

following sections describe the benefit and cost measures and the data sources used in this study.

Cost and Benefit Measures

The primary measure of societal costs is the SSS grant amounts awarded to individual higher-impact SSS projects at colleges and universities across the country. In addition to the grant award, each SSS project has additional costs that are assumed by the college or university that hosts the SSS project and these typically average 14% of the total grant award per institution (Cahalan, Muraskin & Goodwin, 1994).

This study also includes cost measures for overhead costs from the U.S. Department of Education and the cost to society of an individual staying in school as a result of SSS. Each year that a student continues in school increases costs to society. Many of these costs of higher education subsidies are primarily state expenditures, especially subsidies to state institutions of higher education. However, the costs of Pell Grants and Stafford Loan subsidies are federal costs, and therefore are included in this benefit-cost analysis. In summary, the cost measures for each program can be calculated as follows:

	Total costs of all grant awards at 4-year institutions
	Additional monetary assistance provided by host institutions
+	Costs of SSS staff that award grants and provide technical assistance
	Higher Stafford Loan Subsidy and Pell Grant costs
	Total Cost of the SSS program to society.

Other cost analyses of education programs have included factors like the value of volunteer time and transportation (King, 1994), however, SSS projects typically do not utilize volunteers. Transportation costs are minimal since SSS participants are already on campus attending classes. Furthermore, the focus of this study is the benefits and costs of these SSS projects to society. Other costs, such as the opportunity costs of staying in school and not working, are costs to the individual, not to society. Likewise, volunteer time and transportation costs are often costs to the individual, not to society and thus are outside of the scope of this study. In addition, even if a goal of this study was to value these costs, it is often difficult to place a monetary value on volunteer time and costs like transportation would vary from site to site, making it difficult to come up with a consistent monetary value for this cost, borne primarily by the individual (King, 1994).

As with costs, the benefits used in this study include only benefits that accrue to society. Societal monetary benefits of the SSS program result in large part from the increase in graduation rates associated with SSS participation. The measure of benefits are spread across several outcomes and are measured for a time period of 40 years, the average working life employed in other benefit-cost analyses of education programs (Barnett, 1996; Belfield et al., 2006).

The first benefit measure used in this study is increased federal income tax receipts. This measure offers a valid quantifiable measure because education increasingly determines wages. Individuals in society who possess greater education tend to receive higher salaries than those with less education (Psacharopoulos, 1972; Psacharopoulos & Patrinos, 2002; Baum & Ma, 2007, Mortenson, 2008). These higher wages are largely a benefit to the individual, but higher wages lead to higher tax receipts

which benefits society (Institute for Higher Education Policy, 1998; NCES, 2002; Carneiro & Heckman, 2004; Nores et al., 2005). In 2005, the median salary of a bachelor's degree holder was $50,900. The federal income taxes paid by an individual earning the median salary of $50,900 were $9,069, a federal income tax rate of 17.8% (Baum & Ma, 2007). While it may be appropriate to use an income tax rate of 17.8% in my study, I use a federal tax rate of 15%, a conservative measure of the tax contributions, but also consistent with the federal tax rate used in other studies of education programs (Reynolds, Temple, Robertson & Mann, 2002; Belfield et al., 2006).

The second benefit measure used in this study is decreased healthcare costs to society as measured by lower federal Medicaid expenditures. This measure focuses on federal Medicaid expenditures because a reduction in Medicaid expenditures decreases the number of taxpayer dollars needed to run that program, a benefit to society. In addition, Medicaid expenditures have long been used as benefit measures in benefit-cost analyses of programs that benefit children from low-income families (Barnett & Masse, 2007; Belfield & Levin, 2007; Muennig, 2007), and a majority of SSS participants are from low-income families.

The third benefit measure used in this study is the reduced cost of federal incarceration, which focuses on the reduced costs of incarceration at federal levels associated with an increase in college graduation rates (Anderson, 1999; Harlow, 2003). The lower federal incarceration costs due to higher bachelor's degree completion rates associated with SSS participation in higher-impact projects are used to calculate this benefit measure. In summary, the benefits measures used in this study include:

Increased tax receipts
\+ Decreased healthcare costs (Medicaid)
Decreased crime costs (incarceration costs)
Total of Selected Benefits Measures of the SSS program

While the benefits measures described above capture many of the benefits associated with the SSS program's ability to increase college graduation rates, these measures should not be considered all-inclusive. Many of the societal benefits of increasing rates of bachelor's degree completion cannot be expressed in monetary terms. For example, a college education is usually correlated with higher levels of civic participation, including volunteer work, voting, blood donation, and greater levels of openness to the opinions of others (Baum & Ma, 2007). While these attributes are viewed as positive, it would be difficult to assign a distinct monetary value to these characteristics and would make a benefit-cost analysis of such attributes nearly impossible.

Conservative Nature of Cost and Benefit Measures

There are other cost and benefit measures that could be included in this study. For example, including other crime cost reductions, such as criminal justice costs, would produce a measure of greater savings as a result of increasing educational attainment and, in turn, decreasing criminal activity. However, using only the reduced costs of incarceration is a conservative measure of the benefits and is therefore consistent with the goal of this study to produce a moderate benefit-cost analysis through conservative measures of benefits.

Conservative measures of benefits will work to compensate for any positive bias that I may exhibit towards the SSS program. While I do not work directly for the TRIO programs, I do work for the U.S. Department of Education in the Office of Postsecondary Education as the Deputy Director of the Program Oversight Staff. In this position, I am responsible for conducting on-site reviews of TRIO programs, including SSS projects. I have met with SSS project directors and students who have benefited from the SSS program. Therefore, I may exhibit a positive bias towards the SSS program and the conservative nature of my benefit-cost analysis should compensate for any positive bias I may have in regards to the SSS program.

Significance of the Study

A benefit-cost analysis of higher-impact SSS projects is a welcome addition to the field of education research. Cost analyses are rare in education, both in absolute terms and when compared to other fields (Levin, 1988, 2001; Levin & McEwan, 2001, 2002; Monk & King, 1993, Rice, 1997, 2002). The lack of cost analyses is surprising given that policymakers and administrators are increasingly aware of the political and practical importance of being fiscally responsible (Ashdown & Hummel-Rossi, 2002). As researchers Leech and Onwuegbuzie (2004) explain, "in order for policymakers to make educated policy decisions about educational issues, they need to know the cost of their decisions in relation to the size of the effect" (p. 184). However, "establishing a clear link between funds spent on education and specific student achievement outcomes has proved difficult and controversial (Hanushek, 1989, 1994; Hedges et al., 1994).

A benefit-cost analysis of SSS programs provides monetary measures that can be used to make economic comparisons across multiple types of investments (Rice, 1997), which can be used to help determine future levels of funding for the program. In fact, primary education program cost analyses, such as the cost analysis of the Perry Preschool Program, have demonstrated that long-term benefits exceeded costs. This information was "instrumental in shaping public policy supporting funding for early intervention with disadvantaged children" (Hummel-Rossi & Ashdown, 2002, p. 6) and demonstrated that cost analysis can play an important role in education policy.

Limitations of the Study

One of the primary limitations of this benefit-cost analysis is that the relationship between college graduation and the SSS program is an example of correlation, not causation. While participation in the SSS program is correlated with a higher graduation rate, many other variables (including quality K-12 preparation, intelligence, time-management skills, parental support, and personal motivation) are also correlated with college graduation. As well, SSS programs choose their participants by advertising the program on each of their campuses. It is conceivable that the most motivated students apply to the SSS program and this self-selection bias may have a positive effect on SSS outcomes, such as graduation rates. However, the implementation of SSS projects is not consistent, and, while some programs may advertise widely and draw the most motivated students, other programs may use high school transcripts to seek out those students most in need. Therefore, across many different SSS projects, there are many different

recruitment techniques and some may result in more motivated students being involved in SSS, and others may not.

Another limitation of the SSS program is that, because SSS projects are not implemented in controlled experimental settings, it is not possible to account for intervening variables external to the program that may affect program and comparison group participants (Bickman, 2000). For example, an SSS participant's college graduation may have been facilitated by the SSS program, but other student assistance programs, such as campus tutoring programs and remedial courses, may also have had a positive impact. The SSS program is "only part of a larger array of events" (House, 1988, p. 30) that may positively affect academic performance and improve SSS participant graduation rates.

Furthermore, the cost and benefit measures in this study are only partial measures. Research indicates that the measures proposed capture many of the societal benefits and costs associated with the SSS program, but some economic benefits have been excluded from this study, such as increased consumption through greater consumer spending in housing, food, and transportation (BLS, 1995); greater productivity (BLS, 1993) and lower reliance on government assistance programs, such as Temporary Assistance for Needy Families and food stamps (Baum & Ma, 2007; Mortenson, November 2007). In addition, other measures that are difficult to quantify in monetary terms are not included, such as increased charitable giving, community service, and increased quality of civic participation (IHEP, 1998; Baum & Ma, 2007). Finally, this study focuses on the federal costs to society, so costs such as financial aid provided to students by states is not included in this analysis.

Despite these limitations, this study remains a worthy project because it is the first effort to measure the benefits and the cost of Student Support Services, whose primary mission of increasing the retention and graduation rates of low-income students, first generation students, has salience given the growing number of LIFG students in the United States (Tinto, 2004). However, graduation rates of LIFG students have been stagnant in recent years, or by some measures, decreased slightly according to Baum, Payea and Steele (2006), and this only increases the importance of a program like SSS and its efforts to increase retention and graduation rates for LIFG students. Increasing graduation rates of LIFG students is critical to the continued economic competitiveness of the United States.

In summary, this analysis provides economic information about the functioning of a program that works to increase college retention and graduation rates among LIFG college students. It provides a measure of the economic viability of the SSS program that can be combined with information gained from other studies of program effectiveness. The following chapter provides a literature review of research studies and evaluations of SSS projects, offers a review of cost analysis in education and benefit-cost analysis of education programs, and outlines the theoretical underpinnings of this study.

LITERATURE REVIEW

CHAPTER 2

Introduction

Although researchers have conducted reviews and evaluations of the SSS program, a review of existing research suggests that additional analyses are required to understand the monetary benefits and costs to society of the SSS program. To fully understand where the research needs to go, however, it is necessary to understand where it has been. Therefore, the purpose of this chapter is to (1) provide information about the SSS program, its history, and its requirements; (2) provide a literature review of studies and evaluations of the SSS program that focus on the program's effect on graduation rates; (3) provide a literature review of the four types of cost analysis used in the evaluation of education programs; and (4) focus on the use of benefit-cost analysis of education programs. This review establishes the foundation for Chapter 3, which contains the methodology for a benefit-cost analysis of the SSS program.

Historical Background of the SSS Program

Until the second half of the 20th century, the college and university student population in the U.S. came primarily from an elite class (Altbach, Berdahl & Gumport, 1999). However, the enactment of the G.I. Bill of Rights following World War II dramatically altered the status quo. The G.I. Bill provided funds to returning servicemen

and women to pay college tuition costs and living expenses to attend a college or university full-time (Groutt, 2003). This assistance resulted in increased enrollments in higher education (Altbach et al., 1999). In 1958, Congress complemented the G.I. Bill by enacting the National Defense Education Act (NDEA), largely in response to the Soviet Union's successful launch of Sputnik, the first man-made spacecraft to orbit the earth. The NDEA provided funds to promote studies in science and mathematics (Groutt, 2003, National Defense Education Act, Pub.L. 85-864, September 2, 1958, 72 Stat. 1580 20 U.S.C. § 401), and these funds opened the gates of higher education to students who otherwise would not have been able to afford to pursue it (Bowen, 1997).

Access to higher education expanded further in the 1960s with the realization that higher education could help alleviate growing poverty in the United States. In his first State of the Union address on January 8, 1964, President Lyndon B. Johnson continued former President John F. Kennedy's initiatives to reduce poverty by declaring an "unconditional war on poverty." (Bowen, 1997) One of the earliest pieces of legislation passed in the War on Poverty, the "Economic Opportunity Act (EOA) of 1964," contained an experimental program titled "Upward Bound." Upward Bound focused on preparing high school students from low-income backgrounds for postsecondary education (Pell Institute, 2008).

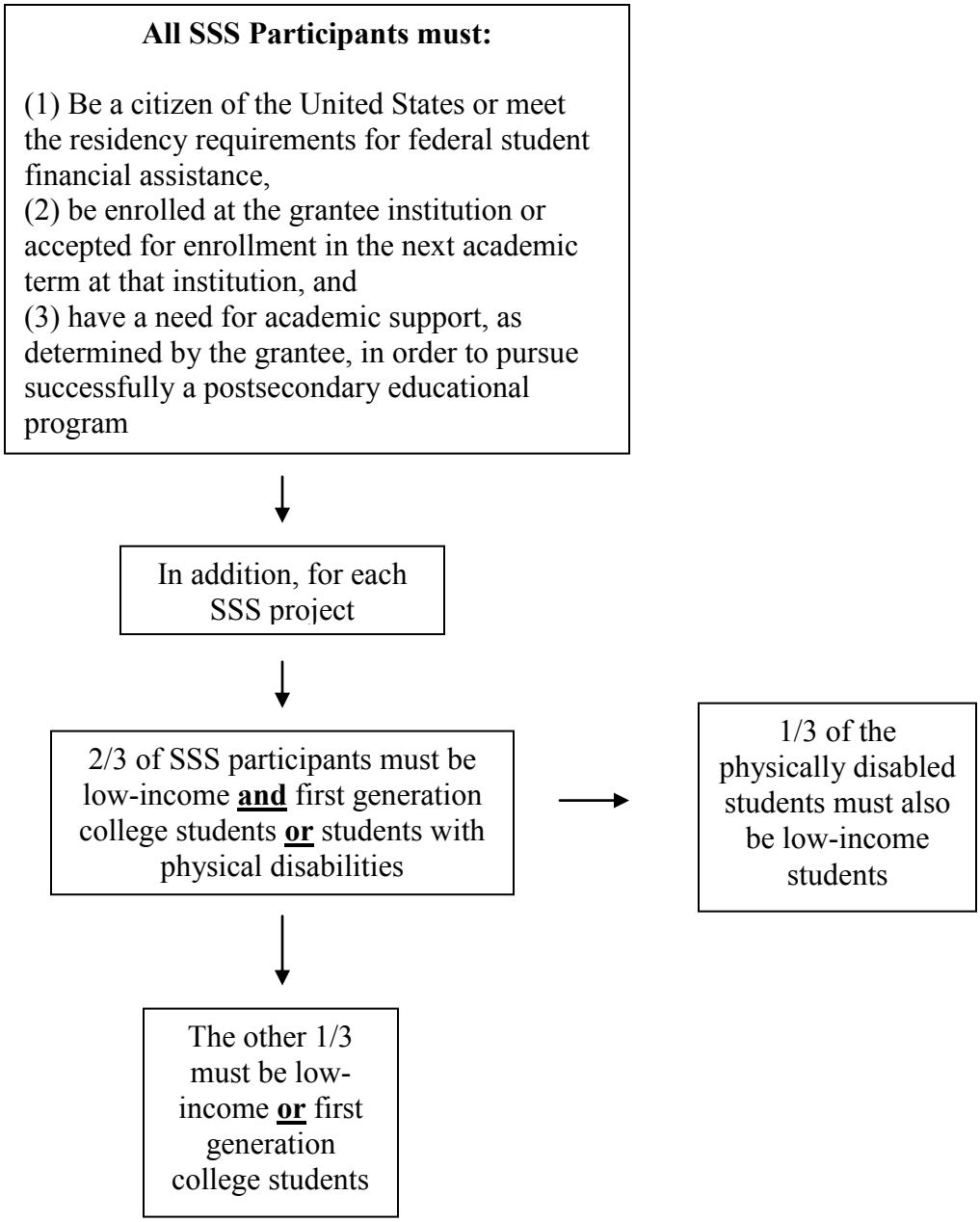
The Higher Education Act (HEA) of 1965 followed the EOA of 1964 and expanded the focus on low-income students by creating Talent Search. Talent Search also focused on low-income students but worked with students as young as 11 years of age and focused on applying for financial aid and college admission. By contrast, Upward Bound worked only with high school students and focused primarily on

academic preparation. In 1968, Congress amended the HEA to include the Special Services for Disadvantaged Students (SSDS) program (later changed to Student Support Services [SSS]), and create—with Upward Bound and Talent Search—a trio of federal programs that focused on low-income students (the group thereafter known as TRIO). SSS provided grants to colleges and universities to increase the retention and graduation rates of LIFG college students. The program required two-thirds of its participants to be LIFG college students and provided services for students with disabilities (20 U.S.C. 1070a-14, Groutt, 2003). The three programs listed above often work in conjunction: Talent Search focuses on preparing middle school and high school students for postsecondary education; Upward Bound focuses on high school students; and SSS assists the students once they reach the postsecondary level.

Since the inception of the SSS program, the federal TRIO programs have grown from three to eight. In addition to Upward Bound (1964), Talent Search (1965), and SSS (1968), "TRIO programs" include Educational Opportunity Centers (1972), the Training Program for Federal TRIO Programs (1976), the Ronald E. McNair Postbaccalaureate Achievement (1986), Upward Bound Math-Science (1990), and the TRIO Dissemination Partnership (1998).

As earlier noted, eligible students for SSS programs must be enrolled in a college or university receiving an SSS grant; two-thirds of the students in any SSS program must be low-income individuals who are also first generation college students or students with disabilities. At least one-third of the students with disabilities must also qualify as low-income. The remaining one-third of SSS student participants needs to meet the low-income or first generation college student criterion (See Chart 1):

Chart 1: Requirement for Each SSS Project



Source: Title IV, Part A, Subpart 2 of the Higher Education Act of 1965, Chapter 1, Title 34, Part 646.3

A low-income student is defined as one whose family income is 150% of the poverty level, adjusted for family size. For more detailed information about low-income student rates for SSS, please see Appendix A. In 2004, about 12% of SSS participants had

disabilities and approximately half of those participants with disabilities came from low-income families (U.S. Department of Education, 2004).

As earlier noted, in 2003-2004, the federal government funded SSS projects at 935 colleges and universities serving over 196,000 college students across the United States and in Puerto Rico through a discretionary grant award competition. The 2004 competition provided 4-year awards to colleges and universities (U.S. Department of Education, 2008b). Institutions submit APRs and based on the results of those reports, U.S. Department of Education SSS program specialists approve or disapprove annual continuation awards for a total of 4 years of the project. Most SSS projects that received funding in year 1 continued to receive funding for the next 3 years. At the end of 4 years, an SSS project may reapply for funding. If existing SSS projects are meeting their goals and objectives, they are awarded prior experience points, which are added to the total score of grant proposals during the discretionary grant competition. The awarding of up to 15 prior experience points helps to ensure that existing successful projects that are receiving funding from SSS continue to do so.

The funding procedure for potential SSS grantees involves a competitive process wherein each SSS application is scored by a team of three outside experts. The SSS applications with the highest combined average score are funded. The following criteria are used to evaluate each application; the maximum number of points that may be awarded is listed after each criterion:

- Need for the Project (24 points)
- Objectives (8 points)
- Plan of Operation (30 points)

- Institutional Commitment (16 points)
- Quality of Personnel (9 points)
- Budget (5 points)
- Evaluation Plan (8 points)

Again, if applicants are previous SSS grant recipients, they are eligible to receive up to 15 additional prior experience points based on the extent to which their project participants have accomplished the following:

- Persisted toward completion of the academic programs in which they were enrolled (4 points);
- Met academic performance levels required to stay in good academic standing at the grantee institution (4 points);
- Graduated, or for 2-year schools, graduated or transferred to a 4-year school (4 points); and
- Met the administrative requirements of the grant—including recordkeeping, reporting, and financial accountability—under the terms of the previous award (3 points)

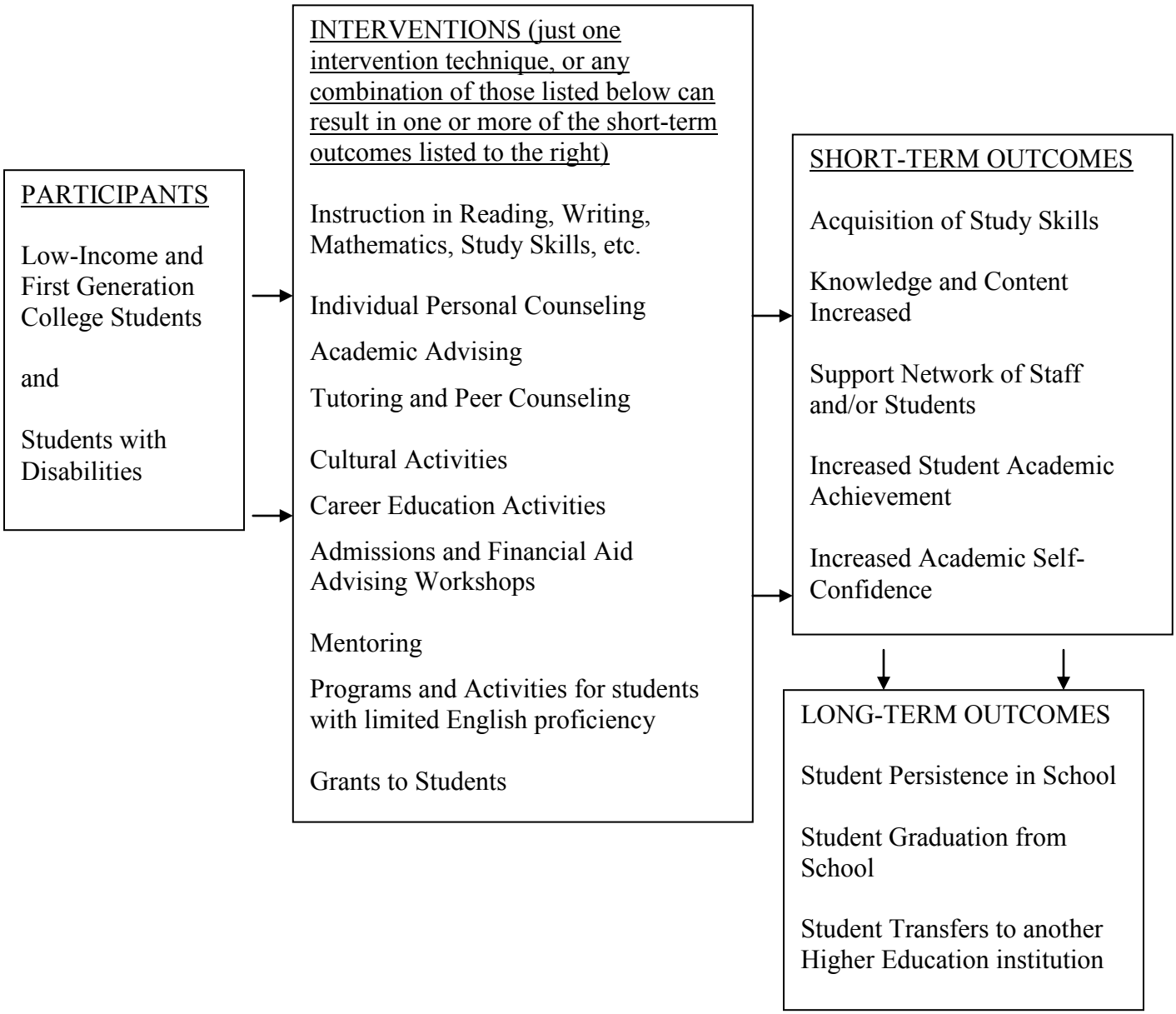
  (Authority 20 U.S.C. 1070a-11 and 1070a-14)

The following section explains how the services provided by the SSS program work to increase graduation rates for participants.

Conceptual Framework of the SSS Program

Underlying the SSS program is a conceptual framework that outlines the process through which the program is supposed to increase student graduation rates. An SSS causal diagram helps to illustrate the program's theory:

Diagram 1: Causal Diagram of the Student Support Services Program



Interventions, or activities, are listed on the left-hand side of the page, the expected short-term outcomes are in the middle of the page, and expected long-term outcomes are on the right-hand side of the page. Arrows indicate how SSS interventions work to affect the short and long-term outcomes of student retention and graduation (Lipsey, 1993).

In the causal diagram, at least two-thirds of the participants are LIFG college students and students with disabilities. Because they meet these eligibility requirements, SSS legislation authorizes grant funds to pay for the following services, labeled as Interventions/Activities. While all of the services listed below are allowed under the SSS program, the services marked with an "*" have proven to be consistently correlated to success for SSS participants based on interviews with SSS project directors in several studies conducted over the past 15 years (Cahalan, Chaney, Chen & Goodwin, 1994; Chaney et al., 1997; Muraskin, 1997; U.S. Department of Education, 2008). In a survey of 5,800 students attending 47 institutions, in which half of the students participated in SSS and half were a matched comparison group, survey results indicated that peer tutoring, cultural events, workshops and instructional courses were particularly effective methods of increasing GPAs, retention rates and the number of credits earned (Chaney et al., 1997). Another study in 1997 found that SSS instructional courses, SSS peer tutoring, and SSS workshops are among the most effective services in improving academic performance and student retention, my study focuses only on successful outcomes overall (Muraskin, 1997). The services marked with a "+" are the most commonly offered (Cahalan et al., 1994; Chaney et al., 1997; Carey et al., 2004):

1. Instruction in reading, writing, study skills, mathematics, and other subjects necessary for success beyond secondary school*
2. Personal counseling +
3. Academic advice and assistance in course selection

4. Peer tutoring and other tutorial services*+
5. Counseling and peer counseling*
6. Exposure to cultural events
7. Exposure to academic programs not usually available to students from disadvantaged backgrounds
8. Career education activities such as SSS Workshops*
9. Activities that help to ensure admission and financial assistance in graduate and professional programs
10. Activities designed to ensure admission and financial assistance to 4-year institutions, for students at 2-year institutions*.
11. Mentoring programs involving faculty or upper-class students
12. Specialized programs for students with limited English proficiency.

(Higher Education Act of 1965, Section 402D.20 U.S.C. 1070a-14 Student Support Services).

In addition to the services listed, SSS projects may provide grant aid to current SSS participants who are receiving federal Pell Grants. The amount of grant aid awarded to an SSS participant may not exceed the maximum appropriate Pell Grant, $4,050.00 for the 2004-05 academic year, or be less than the minimum Pell Grant of $400 for the 2004-05 academic year. In 2004, grant aid accounted for approximately 10% of all SSS grant funds awarded. While little analysis of the effect of grant aid has been done, a study of successful SSS projects completed in 2008 by the U.S. Department of Education indicated that eight of the nine projects chosen provided grants or scholarships to students (U.S. Department of Education, 2008). This finding agrees with recent studies that indicate that graduation rates are positively correlated with receiving grant aid (Swail, Redd & Perna, 2003).

The types of services provided are indicated in program applications and in APRs. As pointed out above, academic services such as peer tutoring and personal counseling are the two services most frequently offered by SSS programs and instructional courses, while SSS peer tutoring and SSS workshops on study skills, writing skills, time

management, financial planning, and other basic skills needed to complete college-level work and persist in college (Muraskin, 1997; U.S. Department of Education, 2008) are among those found to be the most effective services in improving academic performance and student retention.

As the causal diagram indicates, taking advantage of these services is expected/intended to result in multiple short-term effects, including:

- Study skills acquisition
- Increased knowledge and content
- Establishment of a social and academic support network
- Improved student academic achievement
- Increased academic self-confidence
- Increased awareness about financial aid
- Increased access to cultural activities (which may lead to increased interest in the liberal arts)
- Mentoring from upper-class students or staff, which can help guide the student through the college process.

(Higher Education Act of 1965, Section 402D.20 U.S.C. 1070a-14 Student Support Services).

The short-term impacts of these services can result in one of three long-term outcomes: (1) a student persisting in school from year-to-year, (2) a student graduating from college, or (3) a student transferring to another higher education institution.

This benefit-cost analysis focuses on the outcome of graduation from college with a bachelor's degree because the monetary benefits of receiving a bachelor's degree are well documented and provide a strong foundation for this cost analysis.

The next section provides a review of evaluations and studies of individual SSS projects and addresses the effect of such projects on graduation rates of participants.

Review of SSS Studies and Evaluations Measuring Graduation Rates

The SSS program has been the subject of numerous research articles and studies. The studies by the federal government tend to be large-scale, comprehensive evaluations of the SSS program, while others focus on the results of one SSS project on a particular campus. In this literature review, I address comprehensive evaluations of the SSS program, as well as studies of individual SSS projects. As one might expect, these studies exhibit different levels of sophistication in their methodologies.

First, this review discusses studies that use a comparison group consisting of students who are attending college along with SSS participants. These participants did not participate in SSS (1) because they were not chosen, (2) because they chose not to participate, or (3) because they were not eligible to participate in the program. However, the information provided by these studies is limited because the students who participate in SSS are often different from other students on campus who may not be first generation students, may not be from low-income families, and/or may not have a disability. There also may be self-selection bias involved, in which the more motivated students seek out the services offered by the SSS project on their campus.

Second, this review considers studies that use a comparison group consisting of students who would have qualified for the SSS program but were not participants. This design is the most sophisticated methodology provided by current literature on SSS programs and the most useful for assessing the effects of SSS programs because the non-participants share many common traits with the SSS participants. The non-participants, like their counterparts who participate in SSS, are LIFG college students. Consequently, traits that could have an effect on academic performance, such as family income and education level of parents, are held constant for both groups. Due to the ability to hold these key variables constant, these studies deserve the most attention.

Third, this review considers studies that use both a comparison group consisting of all students and a matched-comparison group that consists of students who would have qualified for SSS based on low-income or first generation status but did not participate in the program. These studies demonstrate the negative effect that LIFG status can have on graduation rates of college students and thus, the importance of a program like SSS that helps to mitigate the negative effects of low-income or first generation status through offering programs and services that increase graduation rates.

SSS Studies Utilizing a Comparison Group

Over 30 years ago, a study (Davis et al., 1975) called for further research and more vigorous evaluation of SSS programs, especially in regard to requiring evaluation that includes a comparison of SSS participant performance to the performance of their non-disadvantaged peers at the same institution (Davis et al., 1975). However, this call went unheeded until 1990, when researchers (Pinkston-McKee, 1990) at Chicago State

University conducted one of the first SSS analyses utilizing a comparison group. The study compared retention rates of SSS participants with those of other students at Chicago State University and found positive results for each of the 3 years in the study. These results are summarized in Table 2 below:

Table 2
Retention Rates at Chicago State University

Year Entered CSU as a Freshman	SSS Freshmen Still Enrolled in Fall of 1988	CSU Freshmen Still Enrolled in Fall of 1988
1985	36%	24%
1986	45%	34%
1987	79%	51%

Source: Pinkston-McKee, 1990, p. 18.

While this study (Pinkston-McKee, 1990) did not utilize a matched-comparison group in which students in the comparison group would also be eligible for SSS, I assert that the comparison group in this survey was likely made up of many students who would have qualified for the SSS program because Chicago State University's mission is the education of low-income students, and the university enrolled students whose average ACT score was 13.8, while the Illinois average was 18.9 (Pinkston-McKee, 1990); however, even if other students would not have been eligible for SSS, the results are still impressive. In this study (Pinkston-McKee, 1990), SSS participant retention rates are much higher than for students at-large. That finding supports the contention that SSS has a positive effect on student retention. While the Pinkston-McKee study does not offer any specific data on graduation rates, because higher retention rates generally lead to

higher graduation rates, one can make the assumption that the higher retention rates demonstrated by this SSS project would likely have resulted in higher graduation rates as well.

A later study that also used a non-matched comparison group did offer specific data on graduation rates. A 1998 study of the Rutgers University SSS program revealed that, while the graduation rate was lower for freshman SSS students than for other freshmen, the mean graduation rate over 13 years (1980 – 1992) of 60.6% for entering freshmen was only 4.4% higher than the mean of 56.2% for Rutgers SSS graduates (Thomas et al., 1998). While a lower graduation rate for SSS participants may appear to be a negative outcome, the graduation rate for LIFG college students is usually 20 - 30% lower than the graduation rate for other students from moderate-to high-income families (Baum, Payea & Steele, 2006). Framed against this sizeable disparity in graduation rates, the relatively small disparity in graduation rates listed above could very likely mean that the SSS program was having a positive effect on graduation rates but that the effect was not large enough to completely overcome the negative effects of LIFG status on graduation rates (Bailey, 2005). In other words, even though graduation rates were lower for SSS participants, the small disparity between SSS participants and the general student body may still indicate SSS program success.

Following the study (Thomas et al., 1998) at Rutgers, another study (Walsh, 2000) of an SSS program utilizing a comparison group was conducted at Kankakee Community College in Illinois. This study found that "graduation rates, transfer rates, and GPA levels of those students involved in TRIO [SSS] far exceeded those of a comparison group of similar students not enrolled in the program" (Walsh, 2000, p. 12).

Although Walsh's study states that more than 80% of SSS participants persist in their academic goals each year, it does not include persistence and graduation rates for the comparison group. It only indicates that the percentage of SSS participants who persist in their academic goals is higher than the rate for non-SSS participants (Walsh, 2000). Without more data it is impossible to know how much of an effect the SSS project had on student persistence. Information on the persistence and graduation rates for the comparison group would have provided a more accurate gauge of the degree of success acquired by this SSS program.

SSS Studies Using a Matched Comparison Group

Conducting a matched comparison study provides a better way of controlling for differences between SSS participants and a comparison group of non-participants by ensuring that members of both groups meet the criteria to participate in the SSS program, such as low-income and first generation status. One of the first studies of SSS to enlist a matched comparison group methodology was a 1997 study that compared the performance of SSS participants with a statistically matched comparison group of "non-SSS participants who were those having the highest propensity to participate in SSS, but were not SSS participants" in the academic years 1992-1994 (Chaney et al., 2007, p. 1-8). The results showed that GPAs and earned semester hours were only slightly higher for SSS participants but that SSS participants demonstrated large gains in retention. The retention rate from freshman to sophomore year for SSS participants was 67%, compared with 60% for non-participants. The retention rate from sophomore year to junior year of college was 49%, compared with 40% for non-participants in the comparison group

(Chaney et al., 1997). While one could project that large gains in retention rates and improved GPAs for SSS participants would make graduation more likely, data on graduation rates are not included in this study.

A similar study (Chaney et al., 1998) completed one year later found that SSS participants were more likely than non-participants to complete their freshman year. In addition, the study found that Asians and Hispanic participants had somewhat higher retention rates, and Blacks and Native Americans had somewhat lower rates than other SSS participants (Chaney et al., 1998) raising recognition that often the difference is not minority/non-minority status, but instead, differences according to the race of participant.

SSS Studies Using a Matched Comparison Group and a Non-Matched Group

Two studies (Mahoney, 1998; Bailey, 2005) utilized a methodology that compared the performance of SSS participants to SSS eligible non-participants and to students who were not eligible for SSS. The first study, conducted at West Virginia University (WVU), compared the graduation rates of SSS participants to eligible non-participants and to students not eligible for SSS entering as first-time, full-time freshmen. This study, using data from the fall semesters of 1998 – 2003, found that the highest 6-year graduation rate occurred in the non-eligible student group (62%), followed by SSS participants (52%), and then by SSS-eligible non-participants (50%). These findings confirm research that indicates that students who are not first generation or low-income students graduate at higher rates than their counterparts (Bailey, 2005). It also demonstrates that participation in SSS is positively correlated with graduation, as SSS

participants had a higher graduation rate (albeit only slightly higher) than their peers who were also eligible for SSS but did not participate (Bailey, 2005).

The second study that used a matched and non-matched comparison group was a study of the "EXCEL" SSS project at California State University-Hayward. This study compared the retention and graduation rates of EXCEL program participants to a matched comparison group of non-participants and found that the retention rate of EXCEL participants was 72%, while the retention rate of the comparison group was 58.6%. Data from this study support the theory that higher retention rates lead to higher graduation rates; EXCEL participants graduated 61% of the time, compared to a graduation rate of 55% for non-EXCEL participants in the comparison group, a difference of 6% (Mahoney, 1998). Retention and graduation rates were higher than the graduation rates of the non-matched comparison group that consisted of the entire student population at CSU-Hayward (Mahoney, 1998).

Overall, the findings from these SSS analyses suggest that the SSS program is having a positive effect on student outcomes such as retention rates, graduation rates, and GPAs. However, many of the studies do not provide numerical data that indicate how much of an effect the SSS program has on participants compared to students placed in matched and unmatched comparison groups. Still, even in the absence of numerical data, these comparison group studies repeatedly demonstrate that SSS has a positive effect on retention and graduation rates of its participants. While current SSS research provides evidence of the positive effect of SSS programs, no cost analyses of the SSS program exist. The next section discusses the different types of cost analysis that could be

applied, as well as which type I have chosen to use in my examination of the SSS program.

Cost Analysis of Education Programs

When researchers conduct cost analysis of education programs, they choose one of four primary types: cost-feasibility, cost-effectiveness, cost-utility, or benefit-cost analysis. I considered all four types in choosing which form of cost analysis to utilize in a study of the SSS program and I reviewed the ways they had been used in education research.

Of the four forms of cost analysis mentioned, the most basic is cost-feasibility, which determines if it is possible to implement and maintain a program based on the program's costs (Rice, 1997). A cost-feasibility analysis can inform decision makers about the type and quantity of resources necessary to support a program (Rice, 2002). Historically, this type of cost analysis has been used to evaluate if class size reduction is an economically feasible method for improving academic performance. In the late 1990s, President William J. Clinton proposed a nationwide program to reduce class size for first, second, and third grade classrooms to 18 students (Brewer, Krop, Gill, Reichardt, 1999, Levin & McEwan, 2001). A cost-feasibility study looked at the reasonableness of reducing class size to 20 students (costing an additional $2.1 billion), to 15 students (at a cost of $11 billion) or to 18 students, at an unidentified cost between $2.1 billion and $11 billion. Although it is not definitively known that this study was instrumental in preventing a nationwide class reduction program, it is likely that cost information was one criterion used by policymakers who considered a nationwide class size reduction

program and its fiscal effects (Levin & McEwan, 2001). Ultimately, policymakers decided not to implement class size reduction on a nationwide basis.

The second form of cost analysis used in the study of education programs is cost-effectiveness analysis, which is "an analytical procedure for determining the efficacy of a program in achieving given intervention outcomes in relation to program costs" (Rossi et al., 2004, p. 63). This type of cost analysis is used when one is comparing two or more different programs in an effort to determine which program delivers (1) the best results relative to costs, or (2) the least cost relative to results (Levin, 2001). In other words, cost-effectiveness analysis is concerned with both the costs and effectiveness of a program, with effectiveness being the ability of a program to meet its stated goals and objectives. Cost-effectiveness analysis can only be used to compare programs that have similar goals and outcomes (Ashdown & Hummel-Rossi, 2002).

Focusing on class-size reduction, researcher Henry Levin used cost-effectiveness analysis to look at the costs and effects on student performance of reducing class size versus the costs and effects of cross-age tutoring, which utilizes older students to tutor younger ones under the supervision of adults (Levin, 1988). Levin found that "while reducing class sizes had lower annual costs, cross-age tutoring was three to five times as cost-effective because of its larger effects [on student GPA]" (Levin, 1988; Clune, 2002, p. 59).

Like cost-effectiveness analysis, the third type of cost analysis in education, cost-utility analysis, compares different programs, but cost-utility analysis combines multiple outcomes of each program into a single outcome measure. Within the single outcome measure, each outcome is weighted and combined with the other outcomes to "form a

single measure of utility against which the costs are compared" (Rice, 2002, p.26). When evaluating an education program with many different student outcomes, cost-utility analysis allows the researcher to measure the utility of each outcome for the decision maker(s). Combining these measures into one cost-utility score reflects the value (or utility) that the decision maker(s) place on each outcome (Fletcher, Hawley, & Piele, 1990). Similar to cost-effectiveness analysis, cost-utility analysis evaluates outcomes but can be more complex than cost-effectiveness analysis because it weights multiple outcomes "in terms of their subjective value to the decision maker" (Levin, 1988, p.52).

The fourth type of cost analysis used to evaluate education programs is benefit-cost analysis, which compares the benefits and costs of a program and answers the question of whether a program's benefits exceed the costs by allowing one to determine whether the dollar value of a program's benefits is greater than the dollar value of its costs (Levin & McEwan, 2002). Benefit-cost analysis answers the question, "Is this investment worth it?" through an enumeration and evaluation of relevant benefits and costs (Prest & Turvey, 1965) and "determines the economic efficiency of a program, expressed as the relationship between costs and outcomes" (Rossi et al., 2004, p. 63). Benefit-cost analysis can be "conducted for a single program to provide information about the degree to which an intervention is worth the investment" (Rice, 1997, p. 310). My benefit-cost analysis of higher-impact SSS projects provides an answer to that question.

Brief Overview of Literature on Benefit-Cost Analysis

Benefit-cost analysis rests on the specific ethical concept of Pareto optimality. The term "Pareto optimality" is named after Vilfredo Pareto, an Italian economist who used the concept in studies of income distribution. Since Pareto published his *Manual of Political Economy* in 1906, his concept of self-improvement has underpinned benefit-cost analysis. Benefit-cost analysis and the Pareto theory both support the examination and determination of whether or not benefits exceed costs.

Traditionally, efficient social interventions have been viewed as such when they make at least one person better off while making nobody worse off (Sinden, 1980; Trumbull, 1990; Rossi et al., 2004). In economics, this is called the Pareto criterion and is based on Pareto's concept of social improvement that would have improvement as the only result of a social program (Sinden, 1980; Trumbull 1990; Rossi et al., 2004). However, the Pareto optimum of making at least one person better off and nobody else worse off can be complicated to measure because it is often difficult, (if not impossible) to determine that *nobody* is made worse off by the implementation of a program (Sinden, 1980; Trumbull, 1990; Rossi et al., 2004). Due to this, most benefit-cost analysis uses the *potential* Pareto criterion, which states "the gains must potentially compensate for the losses, with something left over" (Rossi et al., 2004, p.356). Under this theory, the compensation (which is often hypothetical) is part of the Kaldor-Hicks efficiency model and this model rests on the acceptance of compensation by those made worse off by a program (Sinden, 1980; Ng, 1983). Monk uses the term "modified Pareto standard" and

states that according to this standard "efficiency is enhanced as long as those who are made better off compensate those who are worse off and some are made better off" (1990, pp.6-7).

While the potential Pareto criterion (or modified Pareto standard) does ensure that the total gains from a program will exceed the total losses, at times through compensation to those who lose out, these sorts of projects could be viewed as those that the public sector should undertake, since (following compensation) society gains more than it loses. However, the Pareto criterion does not consider equity (Trumbull, 1990; Rossi et al., 2004). While gains can exceed benefits, under the potential Pareto criterion, all of the benefits can go to the wealthy and no benefits to the poor. However, government social programs are often concerned with distributional equity and with improving the quality of life for a particular group or community (Rossi et al., 2004).

Philosopher John Rawls would endorse considering not only issues of efficiency, but issues of equity as well. Considering equity involves recognizing that a program that makes some in society better off and nobody worse off may still be bad for society because inequity among citizens is increasing. While Rawls recognizes the value of a Pareto efficient investment, he also raises the importance of equity and the fact that even if an investment makes some better off and none worse off, if that investment increases inequity greatly, this increase in inequity may negatively affect society in ways that surpass the value of the benefits that the investment produces (Shaw, 1999). In addition, one of the principles of justice supported by Rawls asserts that not only should nobody be made worse off by an investment, but an investment should be structured to provide the greatest benefit to the least advantaged (Rawls, 1971). Finally, Rawls raises the

possibility that some departures of equality are simply unacceptable (Shaw, 1999). In order to account for equity considerations, programs that improve equity *and* provide benefits that exceed costs can be weighted more heavily to demonstrate their greater value to society (Rossi et al., 2004). Weighting these more heavily recognizes that there are many arrangements that are efficient, but efficient investments that also consider equity could be considered as more just (Rawls, 1971).

The SSS program, and other programs that focus their benefits on low-income populations, could be programs that are weighted more heavily under a potential Pareto criterion, if their benefits exceed their costs. A benefit-cost analysis of higher-impact SSS projects will respond to the potential Pareto criterion by determining if the benefits of these projects outweigh the costs, and if they do, it could be shown that these higher-impact SSS projects contribute positively to the overall equity of the distribution of resources throughout society. However, programs such as the SSS program may also increase inequality by raising the incomes of some who partake in it, but not raising or possibly even lowering the wages of less knowledgeable or less skilled portions of the population. While Pareto efficiency is important, Rawlsian equity should be a consideration as well, recognizing that both can exist, but a Pareto efficient investment that also takes equity into consideration endorses an intrinsic egalitarianism that believes that "a society in which primary goods are distributed equally would be better than one that is vastly unequal" (Shaw, 1999, p. 361).

Benefit-Cost Analysis of Education Programs

One of the earliest examples of benefit-cost analysis being used to evaluate an education program is provided by Garms' benefit-cost analysis of the Upward Bound

program. Garms' study attempted to "determine, whether, in an economic sense, the benefits of the Upward Bound program exceed its costs" (Garms, 1971, p. 207). Garms concludes that while the Upward Bound program demonstrates individual and societal benefits, "from the economic viewpoint, Upward Bound is at best a marginal program" (Garms, 1971, p. 220). While several other analyses have been conducted since Garms' 1971 study, a literature review and interviews with U.S. Department of Education SSS staff indicate that no studies since 1971 have considered cost as a primary component in TRIO studies.

As earlier reported, a more recent example of a benefit-cost analysis of an education program is the study of the Perry Preschool Program. Since its implementation in the early 1960s, researchers have tracked actual benefits and costs for participants for over 40 years. Perry Preschool Program researchers randomly chose 58 members of a treatment group and 65 members of a control group using the criteria of "low levels of parent education, low socioeconomic status and low Stanford-Binet IQ test scores" (Nores et al., 2005, p. 246). Societal benefit measures for the Perry Preschool Program included higher tax revenues, lower expenditures on criminal justice, lower victim costs, and lower welfare payments (Nores et al., 2005). Costs of the program to the public included operating costs, such as instructional staff, administrative and support staff, overhead, supplies, and developmental screening, as well as capital costs for classrooms and facilities (Nores et al., 2005).

The Perry Preschool Program has the advantage of having economic data for participants and the control group members through age 40, which is nearly halfway through their working life. The data show that the program group has higher earnings

and lower crime incidence than the control group, which results in benefits to the public that include gains in tax revenues, lower expenditures on criminal justice, lower victim costs, and lower welfare payments (Nores et al., 2005).

However, like most benefit-cost analyses, the level of returns to the program varies depending on the discount rate used to discount the value of future benefits. In the case of the Perry Preschool Program, at a discount rate of 3%, the program returns $12.90 for every dollar spent, and at a discount rate of 7%, the program returns $5.67 for every dollar spent (Nores et al., 2005; Belfield et al., 2006).

The use of random selection and the presence of real economic data over a relatively long period of time make the Perry Preschool study a model of how benefit-cost analysis should be implemented for educational programs because the availability of longitudinal measures of benefits reduces the need for estimates of future economic benefits. For example, in the Perry Preschool study (Barnett, 1985), the children who received the preschool intervention completed more public higher education than the controls, thus costing society more than the controls. However, this cost was eventually returned to society through higher wages and taxes on earnings (Hummel-Rossi & Ashdown, 2002, p. 8).

However, using this longitudinal data, researchers found that the financial benefits of the project to individuals varied by gender. Most striking was the difference in benefits costs for crime reduction by gender; a large proportion of the gains come from lower criminal activity, and that drop in criminal activity comes almost exclusively from males, who are much more likely than females to engage in criminal activity (Nores et al., 2005). Since incarceration costs are a part of the benefit-cost analysis of higher-

impact SSS projects, it is likely that there are differences in the economic returns of SSS by gender as well, with higher benefits for males than for females. Still, the study found that the benefits of the Perry Preschool Program outweighed the costs for males *and* for females.

The benefit-cost analysis of the Abecedarian Program utilized longitudinal measures of outcomes. While the methodology used in the study is similar in nature to the Perry Preschool Program study, due in part to the use of random selection for participants and the presence of longitudinal measures of benefits, the services provided to participants by the two programs are quite different. The Perry Preschool Program offered services for 2.5 hours per day for its participants, whereas the Abecedarian Program offered educational experiences for up to 10 hours per day for children from early in the first year of life until kindergarten (Barnett & Masse, 2007). The children in the Abecedarian Program and in the control groups (a total of 112) were mostly African-American and were "believed to be at risk of retarded intellectual and social development" (Barnett & Masse, 2007). Similar to the Perry Preschool Program study, the Abecedarian program study estimated benefits and costs of the program based on records of program costs maintained by those who operated the program. Researchers used a total of seven program benefit measures, including measures for earnings and fringe benefits, health, and welfare use (Barnett & Masse, 2007).

In arriving at a measure of benefits and costs, researchers applied discount rates of 3% and 7% and found that benefits of the program exceeded the costs in both cases, as demonstrated in Table 3:

Table 3
Abecedarian Program Benefits and Costs per Child (2002 Dollars)

	Discount Rate		
	3%	5%	7%
Program Cost	$35,864	$34,599	$33,421
Program Benefits	$130,666	$72,591	$45,793
Net Present Value	$94,802	$37,992	$12,372

Source: Comparative benefit-cost analysis of the Abecedarian program and its policy implications. Economics of Education Review, 26 (2007).

However, the benefit-cost ratio for the Abecedarian Program is much lower than the ratio for the Perry Preschool Program. The authors of the study assert that one reason for this difference could be that the Abecedarian Program study does not include a benefit measure for decreased crime costs (Barnett & Masse, 2007; Belfield & Levin, 2007).

A third benefit-cost analysis of an education program is the study conducted on the Title I Chicago Child-Parent Centers. Similar to the previous two studies, this study employed random assignment, but the random assignment occurred to a much larger group of participants. A total of 1,539 program and comparison group students born in 1980 participated in the study, which conducted benefit-cost analyses across three different treatment levels: one for a preschool program, one for an extended intervention program, and one for a school-age program. The differing public benefits for each program are listed in Table 4:

Table 4
Cost-Benefit Analysis of Title I Chicago Child-Parent Centers
3% Discount Rate

Type of Program	Average Length of Time for Participants	Present Value of Benefits per Dollar Invested
Preschool Program	1½ years	$3.85
School-Age Program	1-4 years	$1.42
Extended Program	4-6 years	$3.60

Source: Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent Centers
Educational Evaluation and Policy Analysis, Volume 24, Number 4

This benefit-cost analysis was different from those previously listed because it was conducted based on various lengths of attendance. While all programs have participants involved in the program for varying lengths of time, this study actually separated them into three different groups of students based on their length of attendance and participation in the programs. Students who entered the program at ages 3-4 were counted as participants in the preschool-age program, participants who participated in the program for 1-3 years were counted as school-age program participants, and those who participated for 4-6 years were counted as extended intervention program participants.

Using discount rates of 0 to 7%, the analysis demonstrated that benefit measures were robust across all three programs and benefits exceeded costs in every scenario (Reynolds et al., 2002). Similar to the Perry Preschool Program study, the Chicago CDC study also demonstrated different benefit-cost ratios for males and females. The study concluded that "the societal benefit-to-cost ratio for the school-age program was higher

for girls than boys ($3.81 vs. $1.15)" (p. 287) while the ratio was greater for boys ($8.37 vs. $3.23) in the extended intervention program (Reynolds et al., 2002).

A fourth benefit-cost analysis, conducted by Clive Belfield and Henry Levin (2007), calculated the public savings per new high school graduate. By calculating the extra taxes high school graduates pay, the savings in government healthcare costs, the savings to the criminal justice system, and reductions in welfare payments, Belfield and Levin compared these benefit measures to the public costs of five intervention programs that were shown to raise the rate of high school graduation.

Two other programs studied by Belfield and Levin (2007), the Perry Preschool Program, and the Chicago Child-Parent Center program, are profiled above. Belfield and Levin also conducted benefit-cost analyses on the First Things First program, Project STAR, and a Teacher Salary Increase Program. The First Things First program was a comprehensive school reform program based on small learning communities; Project STAR focused on reducing class sizes in grades K-3 from 25 students to 15 students; and the Teacher Salary Program estimated the effects of raising teacher salaries.

In addition to considering program costs, Belfield and Levin (2007) factored in the costs to the public of additional educational attainment for each of the programs listed above, because increasing high school graduation rates also increases postsecondary education participation (Belfield & Levin, 2007). Belfield and Levin estimated the additional costs were "equal to an average of $24,735 for each additional graduate, factoring in attainment costs of $19,592 for a high school graduate, $35,519 for students who complete an associate's degree and $57,348 for a bachelor's degree" (Belfield & Levin, 2007, p. 187).

Belfield and Levin (2007) then compared these costs to benefits in four different categories, including extra tax payments, public health savings, criminal justice system savings and welfare savings. Belfield and Levin calculated that each new high school graduate would provide $209,200 in benefits. The final step in Belfield & Levin's analysis was to compare the average costs of each program to the average benefits, as outlined in the Table 5 below:

Table 5
Summary of Results from Belfield & Levin Cost-Benefit Analysis

Intervention	Total Benefits Per Additional High School Graduate[a]	Program Cost per Additional High School Graduate	Benefit-Cost Ratio
Perry Preschool Program	$209,200	$90,694	2.31
First Things First	$209,200	$59,066	3.54
Chicago Child-Parent Center Program	$209,200	$67,714	3.09
Project STAR	$209,200	$143,597	1.46
Teacher Salary Increase	$209,200	$82,036	2.55

[a] including additional education attainment cost of $24,735
Source: (Belfield & Levin, 2007)

The data in Table 5 provide evidence that each program examined produced benefits that exceeded their costs and, therefore, resulted in positive benefit-cost ratios.

The benefit-cost analyses for the four studies listed above (Perry Preschool Program, Abecedarian Program, the Chicago Child-Parent Centers program and the Belfield & Levin study of five educational interventions) provide models that I have been able to use in constructing the methodology for my benefit-cost analysis of the SSS

program. While the methodologies of these three studies are not identical, they employ several strategies for calculating cost and benefit measures that I have incorporated into my benefit-cost analysis methodology.

Summary

This literature review had four purposes. The first purpose was to provide information about the SSS program, its requirements, funding, and a conceptual framework of how the SSS program provides services that work to increase graduation rates of participants. The second purpose was to provide a review of SSS studies and evaluations that focused on the SSS program's effect on participant graduation rates using matched and unmatched comparison groups.

The third purpose was to provide a literature review of the four different types of cost analysis used to evaluate education programs. The fourth and final purpose of this chapter was to provide a literature review of the use of benefit-cost analysis in the evaluation of four different education programs. It is these four studies that have provided a framework for my methodology, which is outlined in the next chapter.

RESEARCH DESIGN AND METHODOLOGY

CHAPTER 3

Introduction

There are many programs that, similar to SSS, work to increase college success rates of low-income and first generation students. Some may even boast higher graduation rates for participants than SSS. SSS is the focus of this study for several reasons. First, SSS is present on more campuses than any other program that targets resources to improving retention and graduation rates of low-income and first generation students. There are 643 public 4-year institutions in the United States and SSS is present on just over half, or 329 of them (Tinto, 2004). Second, this program represents a large investment of federal funds. The federal government has spent billions of dollars on the SSS program over the years, and over one billion dollars in the last 4 years alone (www.ed.gov/print/programs/triostudsupp/funding.html). A measure of the costs and benefits of a program of this size and magnitude can help to guide future large-scale investments of federal funds. Third, although the SSS program has been successful at increasing college graduation rates on many campuses, the program was nearly zeroed out in 1996 and has been level-funded since 2000 (U.S. Department of Education, 2008b). A benefit-cost analysis can provide data that can help to determine if funding should be increased or decreased in the future.

This study analyzes data from several sources to compile societal benefit and cost measures associated with higher-impact SSS projects. In project year 2005, at 4-year colleges, the SSS program consisted of 480 individual SSS projects housed on college and university campuses across the United States. This study focuses on the benefits and costs of SSS projects at 4-year colleges and universities because the specific research question looks at the monetary benefits of completing a bachelor's degree.

There are two primary reasons for the focus on bachelor's degree completion. First, many studies over the past 30 years have documented the relationship between bachelor's degree completion and higher earnings, lower healthcare costs and lower crime costs. Second, because the transfer rate from 4-year institutions is much lower than the transfer rate from 2-year institutions, graduation data collected from 4-year institutions are much more accurate. For students who participate in SSS at 2-year institutions and then transfer to 4-year institutions, their efforts to complete a bachelor's degree often are not tracked because SSS rules and regulations do not require the tracking of students once they leave the institution hosting the SSS project (Zhang & Chan, 2007).

Research Question

The purpose of this study is to answer the following research question:

Do the monetary benefits to society of the SSS program exceed its costs for select higher-impact SSS projects at 4-year colleges and universities across the United States?

As earlier noted, the benefits measured in this study are monetary benefits that accrue to society as a result of a higher percentage of students obtaining a bachelor's degree. Therefore, this study focuses on the benefits and costs to society of the higher impact SSS projects as a result of the program's positive effect on bachelor's degree attainment.

The six-year bachelor's degree graduation rate for LIFG students at the first institution enrolled is 31.4% for LIFG students attending public 4-year institutions and 42.3% for LIFG students attending private 4-year institutions (BPS: 96/01). This benefit-cost analysis includes SSS projects hosted at public and private institutions. Of the total 40,117 SSS participants, 30,596 attend public institutions with an average graduation rate of 31.4% for LIFG students and 9,521 attend private institutions with an average graduation rate of 42.3% for LIFG students. To compute an average graduation rate for use in this benefit-cost analysis, it is necessary to average the two graduation rates, while weighting the public institution graduation rate heavier, since just over three in four SSS participants in this analysis attend public institutions. Therefore, the weighted average graduation rate is calculated using the following formula:

$$\frac{3.04\ (31.4) + .96\ (42.3)}{4} = 34.1\%$$

A cumulative review of graduation rate data from SSS projects at four-year institutions across the country reveals a wide variety of graduation rates, ranging from 0% to 100% (U.S. Department of Education, 2009). This study focuses on higher-impact SSS projects that have graduation rates that exceed the average graduation rate by 2.5%, by 5% and by 10%. I focused on three groups of successful projects – the most effective

45%, the most effective 40% and the most effective 32% of all SSS projects that reported a graduation rate in their 2005-2006 APR data. Therefore, this study looks at the benefits and costs of projects of projects with graduation rates of at least 36.6%, 39.1% and 44.1%. This is not a small number of elite SSS projects; of the 360 SSS projects that submitted complete graduation rate data, 164 SSS projects (45%) have a graduation rate of at least 36.6%, 146 projects (40%) have 6-year graduation rates of at least 39.1%, and 116 (32%) of projects have a graduation rate of at least 44.1%.

To examine the economic benefits of SSS participation, it is necessary to recognize the economic benefits accrued by society as the result of an SSS-participant college graduation rate of 36.6%, 39.1%, and 44.1% when compared to the LIFG national average graduation rate of only 34.1%. The most effective SSS projects all have a graduation rate that exceeds the national average graduation rate of 34.1%, allowing for a benefit-cost analysis to be done comparing the that rate to the graduation rate at this high, moderate and modest impact SSS projects. It was not possible to use all SSS projects with this study's methodology because the average graduation rate for all SSS participants is roughly the same as that of LIFG students as measured using the BPS survey (BPS 96/01; SSS APR Data, 2005). In addition, if a benefit-cost analysis of the most effective SSS projects produces a positive ratio, meaning benefits exceed costs, then a logical next step will be to study the characteristics of these projects that are the most successful and attempt to replicate project outcomes from these highly effective projects in other locations where graduation rates of SSS participants fall below the national average graduation rate. A better understanding of the characteristics of highly effective projects could lead to better results for all SSS projects.

Focusing on higher-impact SSS projects, this study uses the difference in graduation rates between LIFG students who do not participate in these higher-impact SSS projects and the graduation rates of SSS higher-impact project participants to calculate the societal benefits associated with the participation in these higher-impact SSS projects. As mentioned in Chapter 1, not all SSS participants are LIFG students, but 61.7% of SSS participants in higher-impact projects are LIFG, less than one percentage point lower than the percentage of LIFG students that are in all SSS projects, which is 62.5%. However, this study focuses on LIFG students, recognizing that a minority of SSS participants are not LIFG.

Data and Sample

This study uses data from a variety of sources to arrive at cost and benefit measures. First, this study uses data from Section V of the higher-impact SSS projects' APRs, in which each higher-impact SSS project with a graduation rate of at least 36.6% reports on the progress of students who participate in their respective project. The APR includes information provided by SSS grantees on the graduation rates of SSS participants at each SSS project. Of the 480 SSS projects funded at 4-year campuses in 2005-2006, only 360 projects submitted graduation rate data. The 120 projects that did not submit data could not calculate a 6-year graduation rate because: (1) the project was not funded in 2000-2001, (2) the project did not enroll freshman in 2000-2001 or (3) the project did not submit APR data for 2000-2001. For the remaining 360 projects that did submit graduation rate data (75% of SSS projects at 4-year institutions), the graduation rates varied from 100% to 0%, with very few projects at either extreme, and over 90% of

projects graduating between 10% and 80% of their participants (SSS, APR Data www.ed.gov/programs/triostudsupp/efficiencyintro2005-06.html). This study focuses on the most successful 45% of these higher-impact SSS projects that graduate 36.6% or more of their participants (See Appendix C).

Data for cost and benefit measures comes from a number of sources. Measures of the costs to society of the SSS program consist primarily of (1) the costs of SSS grant awards provided by the U.S. Department of Education, (2) additional funds provided by the campuses that host SSS projects across the country, (3) the federal costs of SSS program oversight, and (4) the additional societal costs of Stafford loan subsidies and Pell Grants. These cost data are obtained primarily through the U.S. Department of Education.

Benefit data consist of increased tax receipts due to higher salaries earned by college graduates, lower healthcare costs measured through lower federal Medicaid expenditures, and lower costs of crime to society, measured by lower incarceration costs. Data on benefit measures are collected from the U.S. Census, the U.S. Department of Education, U.S. Department of Health and Human Services (HHS), U.S. Department of Labor (DOL) and the U.S. Department of Justice (DOJ) to estimate the benefits of the SSS program. A detailed description of each cost and benefit measure and its data source is provided in Table 6 on the following page:

Table 6
Cost and Benefit Measures and Data Sources

Cost Measures	Data Sources
Grant Awards	U.S. Department of Education, Office of Postsecondary Education, TRIO Programs
Campus Program Costs	14% of SSS Project Grant Awards (Cahalan, Muraskin & Goodwin, 1994)
Department of Education Oversight of SSS Program	U.S. Department of Education, Office of Postsecondary Education Executive Office
Higher Stafford Loan Subsidies and Pell Grant Costs	Digest of Education Statistics
Benefit Measures	
Increased Income Tax Receipts	U.S. Census Bureau Current Population Survey, Annual Social and Economic Supplement
Decreased Healthcare Costs (Medicare Expenditures)	The College Board Medical Expenditure Panel Survey (MEPS), U.S. Department of Health & Human Services
Reduced Costs of Crime (Incarceration Costs)	Bureau of Justice Statistics, U.S. Department of Justice

Cost Measures

Grant Awards

SSS grant awards supply a large percentage of the costs associated with the higher-impact SSS projects that are the focus of this study. For the 2005 project year, the U.S. Department of Education awarded $51.8 million to the 164 SSS projects that have a

graduation rate of at least 36.6%, $44.7 million to the 146 SSS projects that have a graduation rate of at least 39.1%, and $36.4 million to the 116 SSS projects that have a graduation rate of at least 44.1%.

Campus Program Costs

The second cost component for the SSS program is a measure of additional program costs that exceed the SSS grant award. Only one previous study has reported on this cost component. This study reported a total operating budget for the project that was 14 % higher than the SSS grant award (Cahalan et al., 1994, p. 6-22).
While interviews with SSS staff have indicated that this amount might be high, the inclusion of 14% of grant awards as institutional contributions ensures that this analysis captures the total contributions of institutions to SSS projects.

The measure of 14% does not include institutional contributions of office space (that occur on every campus) and equipment (that occur on some campuses). The costs of donated office space and equipment are accounted for in the indirect cost rate of 8 % of the operating budget of the award provided to the college or university hosting the SSS program and included in the total grant award. However, the additional 14 % can also include items such as institutional contributions to project staff salaries, materials, transportation, and special events such as banquets or social gatherings.

Department of Education Oversight of SSS Program

While grant funding is the largest cost driver for the SSS program, this study also includes the cost of SSS program officers employed by the U.S. Department of Education to oversee the daily operation of SSS projects across the country and to provide technical assistance to SSS grantees. SSS program specialists who work in the Office of Postsecondary Education oversee the daily operation of SSS projects across the country and provide technical assistance to SSS grantees, approve personnel and budget changes, and are instrumental to the continued operation of SSS projects. As of March 2009, the Department of Education was employing 14 program specialists, who spend at least a percentage of their time on SSS, as well as a percentage of the salaries and fringe benefits of TRIO senior management and the Program Management and Development Team (who spend half of their time on college preparatory programs, including SSS). Other costs included are the cost of office space, computers, equipment and supplies for these employees, as well as the costs of travel for these employees to conduct on-site evaluations and monitor these grants. The estimated cost for Department of Education oversight ranges between $275,000 and 450,000, depending on the number of projects for which oversight is provided. The data source for this information is the Executive Office of the Office of Postsecondary Education, located within the U.S. Department of Education.

Higher Stafford Loan Subsidies and Pell Grant Costs

The final two cost measures are the additional cost for Pell Grants and Stafford Loans that are accrued by the Department of Education as a result of higher-impact SSS projects operating on these 164 campuses across the United States. The costs associated

with Pell Grants and Stafford Loans are significant because the majority of SSS participants are low-income and in 2003-04, 99 percent of low-income students received a Stafford Loans and the cost to subsidize Stafford Loans is $1,000 over 5 years (IES, 2008, p. 17)

Pell Grant costs are also significant because 74.1% of low-income and first generation students received Pell Grants (BPS 96/01). Lower percentages of students who are *only* low-income, *only* first generation or *only* disabled received Pell Grants, but this study rounds the average of 74.1% up to 75% for ease of calculation and to ensure that the maximum cost for Pell Grants is included in this analysis. The average Pell Grant for academic year 2005-2006 was $2,456 per year (Baum & Steele, 2007).

Benefit Measures

While the calculation of SSS project costs can be straightforward, calculating the benefits of these projects is more complex, in part because the benefits of the SSS projects must be measured over an extended period of time. The added complexity of benefits measures seems to be consistent with other studies (Barnett, 1996; Schweinhart et al., 2007). Researchers indicate that in the evaluation of education programs they "tend to devote most of their time to the calculation of program benefits" because "costs typically are considered easier to determine" (Temple & Reynolds, 2007, p. 128). A detailed explanation of the benefit measures for this benefit-cost analysis begins with increased federal income tax receipts and then continues with a discussion of reduced federal Medicaid expenditures and reduced costs of federal incarceration.

Increased Federal Income Tax Receipts

The most direct societal monetary benefit associated with graduation from college is increased federal income tax receipts. Wages are largely determined by education level. This link between education and taxes paid is supported by economic data from several sources, including research indicating that students with at least some college education paid 76.6% of all federal income taxes, even though they only accounted for 55.1% of the households (Mortenson, 2004). Those segments of society that possess greater education receive higher salaries than those with relatively less education. Higher wages lead to higher tax receipts (NCES, 2002; Carneiro & Heckman, 2004; Nores et al., 2005). Federal, state and local income taxes account for a national average of 31% of total earnings.

Since the U.S. tax system is progressive, the more money one makes, the more taxes one pays. As a result of the progressive tax system, increasing earnings directly benefits not only the individual, but society as well (Barnett, 2006). A conservative federal income tax rate of 15% is used in this study to calculate the benefit, although the actual federal tax rate for this group is estimated to be 17.8% (Baum & Ma, 2007). In addition, this tax rate does not account for the gain in taxes associated with an increase in marginal tax rates as a result of higher earnings associated with bachelor's degree completion (Carniero & Heckman, 2005). The income tax revenue gains associated with college graduation are calculated using median income earnings information provided by the U.S. Census Bureau's Current Population Survey, 2005 Annual Social and Economic Supplement. The median income in 2005 for bachelor's degree holders was $50,900 (Baum & Ma, 2007).

I assume that education/earnings profiles that exist today will continue for the next 40 years. Researchers have used this assumption in other benefit-cost analyses of education programs and every indication is that the economic benefits of a bachelor's degree will continue in the future (Nores et al., 2005; Belfield & Levin, 2007). While some studies use a working life of 50 years, a 40-year working life means that a person who begins working upon college graduation (age 22 or 23 for the traditional student) is eligible to retire at age 63. However, this study utilizes six-year graduation rates, which means that many SSS participants are closer to age 25 when beginning work and closer to age 65 when retiring after working for 40 years. I use an average working lifespan of 40 years for this study (ages 25-65) to provide for the fact that some SSS participants may choose to work longer and others may choose not to, or be unable to work a full 40 years. Finally, while a 40-year working lifespan is most common, it is also uniformly used in longitudinal benefit-cost analyses (Nores et al., 2005).

Decreased Healthcare Costs (Lower Federal Medicaid Expenditures)

The second benefit measure I use in my study is lower healthcare costs. In general, college graduates experience lower healthcare costs as compared to those who do not graduate from college. These lower healthcare costs are often the result of habits such as eating more healthy foods, exercising regularly, and choosing not to smoke (Shea, 1991; U.S. Department of Health and Human Services, 2001; Reynolds et al., 2002). While these habits decrease healthcare costs, private funds (typically from employer provided health plans) pay the majority of healthcare costs for college graduates.

Since this study focuses on the societal benefits of the SSS program, reduced public healthcare spending, in the form of reduced federal expenditures on Medicaid are used. Medicaid expenditures are the single largest societal healthcare expense for people under age 65 (Belfield & Levin, 2007), the majority of Medicaid costs are paid by the federal government, and Medicaid costs are well documented. In addition, Medicaid participation is based on means-tested formulas, which require that a recipient's income and assets must fall below a certain level to receive Medicaid. An educational intervention such as SSS that improves educational attainment will reduce the number of people who are eligible for Medicaid because better-educated people earn more income, are more likely to have a job that includes healthcare benefits, and are less likely to be unemployed (Baum & Ma, 2007; Muennig, 2007).

Data for this measure comes from two sources. First, data from the College Board are used to determine the percentage of individuals with some college who participated in Medicaid in 2005 and the percentage of college graduates who participated in Medicaid in 2005. For the year 2005, 15% of those students with some college participated in Medicaid, while only 6% of college graduates participated in Medicaid. Second, the Medical Expenditure Panel Survey (MEPS) provides cost data for participation in Medicaid. MEPS is sponsored by the U.S. Department of Health and Human Services and is the most complete source of data on the costs of healthcare (Belfield & Levin, 2007).

Reduced Cost of Crime

The third benefit measure generally included in economic analyses of education programs and used here is the reduced cost of crime associated with higher levels of education. A survey of inmates in federal prisons reveals that 27% are high school graduates, 16% are individuals with some college, and only 8% of federal prison inmates are college graduates (Harlow, 2003; Mortenson, 2007).

While this lower rate of incarceration by education level is not meant to indicate causality (that is, higher rates of education cause lower incarceration rates) the third measure of benefits does recognize the consistent correlation between incarceration at state and federal levels and acquiring a bachelor's degree. Decreasing numbers of incarcerated persons who are high school and college graduates indicate an inverse relationship between education and incarceration. The data demonstrate repeatedly that the more education one has, the less likely one is to be incarcerated (Erisman & Contardo, 2005).

The data source for this measure is U.S. Department of Justice, Bureau of Justice Statistics (BJS). BJS data indicate that in 2004, 180,328 prisoners were incarcerated in the federal prison system. Using BJS data, I calculate the projected reduction in the actual number of prisoners by educational attainment based on the percentages stated above. This number of prisoners will then be multiplied by the average 2005 annual cost of $22,632 for a federal inmate to determine a cost savings due to educational attainment. Using annual costs for prison is appropriate because the average prison sentence in the United States is 5 years (www. ojp.usdoj.gov/bjs/sent.htm, May 20, 2008), and in

calculating the benefits for this measure, this study uses a 5-year prison sentence and assumes that 60% of prison sentences take place between the ages of 25-30 (Lochner & Moretti, 2004), 20% take place between the ages of 30 and 35, and the remaining 20% of prison sentences (and therefore federal incarceration costs) take place between the ages of 35 and 65.

Benefit-Cost Analysis

This study utilizes the benefit and cost measures listed to compare the monetary value of the benefit measures and the cost measures to determine which is greater. To accurately compare costs that occur in the 2005-2006 project year of SSS program participation and benefits that occur over 40 years of work, I must account for the changing value of money over time. I make assumptions about how earnings will grow over the next 40 years. Because project year 2005-2006 has ended, some costs are actual, such as the amount of grant awards and the costs of Department of Education oversight of higher-impact SSS projects, and others are estimated, such as costs for Stafford Loan subsidies and Pell Grant costs. All benefits are estimated, and are summarized in Table 7 on the following page:

Table 7
Summary of Cost and Benefit Measures

Monetary Costs of SSS	**compared to**	Monetary Benefits of Higher Graduation Rates Experienced by SSS Participants*
Total Cost of all Grant Awards at 4-year institutions + Contributions by Host Institutions (14%) + Costs of SSS staff to provide technical assistance and oversight + Costs of Increased Stafford Loan Subsidies and Pell Grant Costs		Higher Tax Receipts + Lower Healthcare Costs (Medicaid Expenditures) + Lower Costs of Crime (Incarcerations Costs)
Societal Costs of SSS		**Societal Benefits of SSS**

*Due to the fact that benefits are estimated over the next 40 years, benefit measures are discounted at rates of 3%, 7% and 10% to account for differing assumptions about the value of money in the future.

The benefit-cost analysis in this study depends on the discounted sum of costs and the discounted sum of benefits calculated for the increased graduation rates of higher-impact SSS projects. Both are calculated the same way so that the benefits are equal to:

$$B = \sum \frac{B_t}{(1+i)^{t-1}}$$

In this equation, B is the benefit, t is the year in a series ranging from one to 40, and *i* is the discount rate. In a similar formula, the sum of costs are equal to:

$$C = \sum \frac{C_t}{(1 + i)^{t-1}}$$

In this equation, C is the cost, t is the year in the series and *i* is the discount rate. Benefits and costs are calculated for one project year because cost and benefit numbers change very little from year to year. The number of graduates that an SSS project has one year is unlikely to change much in the following year because the projects operate for a number of years on college campuses. In addition, funding for the SSS program is very consistent and the projects under consideration are not any more or less costly than other SSS projects. These higher-impact projects do obtain higher graduation rates than other SSS projects, however. Finally, at four-year institutions, the average length of service for the majority of participants is between 6 months and 2 years, so using data from one project year is appropriate since the majority of students receive services from SSS for that length of time (Zhang et al., 2005). Annual benefit and cost measures are calculated following the format in Table 8 on the following page:

Table 8
Annual Cost and Benefit Calculations of SSS

Project Year	Monetary Costs of SSS[a]	Monetary Benefits of SSS[b]
2005-2006	-	
2007		-
2008		-
2009 through 2047		-
	Total Costs in 2005 Dollars	**Total Benefits in 2005 Dollars**

[a] (1) Total Cost of Grant Awards
(2) Host Institution Contributions (14% of grant award)
(3) Costs of Department of Education Oversight of the SSS Program
(4) Increased Stafford Loan Subsidies and Pell Grant Costs

[b] (1) Higher Federal Income Tax Receipts
(2) Lower Healthcare Costs (Federal Medicaid Expenditures)
(3) Lower Costs of Crime (Federal Incarceration Costs)

After applying discount rates of 3%, 7% and 10% to benefits and costs, the final step of the cost analysis is to compare the costs and the benefits of the SSS program in a benefit-cost ratio:

$$\text{Benefit-cost Ratio} = \frac{\text{Total Monetary Benefits of SSS}}{\text{Total Monetary Costs of SSS}}$$

If the value of the benefit-cost ratio is greater than 1, the benefits exceed the costs as measured in this study; and, if the value of the benefit-cost ratio is less than 1, the costs exceed the benefits, as measured in this study.

Limitations and Assumptions of the Study

My measures of benefits and costs are limited because some benefit and cost measures are not included in this analysis. For instance, while I use federal income tax receipts to provide an economic benefit measure of acquiring a college education, I do not include measures for increased state, local, and property taxes that regularly accompany a higher income. For example, each bachelor's degree leads to $55,600 in additional state income taxes over a lifetime, and 34% more in property taxes than is paid by the average high school graduate (Trostel, 2008). These additional taxes provide significant economic benefits to society and are not included in this study, primarily because this study focuses on benefits and costs to the federal government, and these taxes, while benefiting society, primarily benefit state and local government. To calculate the value of state income taxes and property taxes is outside the scope of this study because the value would vary by state, and the SSS projects under consideration in this benefit-cost analysis are located in states across the country. In addition, this methodology is similar to other benefit-cost studies that include only federal tax benefits (Belfield & Levin, 2007).

While the use of Medicaid expenditures as a proxy for healthcare costs to society allows for the single largest measure of such costs for individuals under age 65, it does not include other measures of healthcare costs to society, including Social Security Disability insurance and Medicare payments for those under age 65 (Belfield & Levin, 2007). Similarly, although the costs of federal and state incarceration provide the largest single measure of crime costs, it is not a comprehensive measure of the costs of crime to

society. Again, limiting these costs ensures that the benefits measures in this benefit-cost analysis remain conservative.

In addition, this study does not consider the effects of graduate education on income. The benefits are measured to include only the economic benefits of completion of a bachelor's degree. Measures of benefits would be higher if graduate education were included because students who earn a graduate degree will earn more over the course of their working lifetime than students who have not earned a graduate degree (Leslie & Brinkman, 1987; Bowen, 1997; Baum & Ma, 2007; Mortenson, 2007).

An additional limitation is not unique to this study but applies to all benefit-cost analyses. Benefit-cost analysis does not provide information about "how much" of an intervention is necessary to produce a benefit, and it does not reveal the "optimal level of use" of program components (Levin & McEwan, 2002, p.15). While a benefit-cost analysis indicates whether the benefits of a $250,000 SSS project exceed its costs, it provides no information about whether an SSS project with a cost of $150,000 would have yielded similar benefits. This benefit-cost analysis measures the cost of the SSS program as it is currently implemented, but it does not indicate if a program implemented with less funding would obtain the same outcomes and, thus, a higher ratio of benefits to costs.

An assumption of the study is that the economic benefits of a college degree will continue to exist much as they do today. However, economic realities change over time. In 1970, the salary of high school graduates was much closer to that of college graduates than it is today (Baum & Payea, 2005). The United States continues to produce record numbers of new college graduates each year. My projections of the benefits of the SSS

program are based on the belief that the economy will continue to produce higher paying jobs for those that hold a college degree. While every economic indication is that this is the case, when costs are projected, it is impossible to state with absolute certainty that the economic benefits of a college degree will continue to exist in the future.

Conclusion

Many interventions focus on improving the college retention and graduation rates of LIFG college students, but the benefits and costs of those interventions are not known. This benefit-cost analysis provides information about benefits and costs of higher-impact SSS projects that help LIFG students to graduate at higher rates than other LIFG students. Programs that focus on this population of college students have limited resources, so a benefit-cost analysis can inform policymakers about which programs produce monetary benefits that outweigh their costs, and if the benefits do outweigh the costs, this evidence can be used to support expansion of the program.

However, taking action based solely on a benefit-cost analysis could be a faulty interpretation of the findings. A danger of benefit-cost analysis is that policymakers and/or lawmakers will do exactly that. This threat places extra responsibility on researchers using benefit-cost analysis to inform their audience that information gathered from cost analysis should not be the sole component in making decisions (Levin, 2001). Benefit-cost analysis should be only one component of evaluating a program and a benefit-cost analysis only addresses the functioning of a program within its current scope. For instance, if a program's costs exceed its benefits, there may be good and valid reasons for this occurring, and the program may still be a good investment of public

funds. There may also be political reasons for wanting to continue a program that benefits low-income and first generation students, because these are historically disadvantaged populations and current programs such as SSS may work to address inequities that result from previous or current policies that result in inequitable K-12 education experiences. In addition, there may be moral or ethical reasons for wanting to continue a program that targets low-income and first generation students and increases their education level, enabling them a better chance at securing a higher paying job, and increasing the egalitarian distribution of opportunity and wealth. Therefore, a benefit-cost analysis can provide only one measure of program success but should not be the sole measure of program success, and the outcomes of a benefit-cost analysis should be viewed within a larger economic, political, historical, and ethical context.

RESULTS

CHAPTER 4

Research Findings

This benefit-cost analysis determines if the costs of higher-impact SSS projects exceed the benefits. This study looks at four measures of cost and three measures of benefit to compare the total value of the societal benefits and costs of SSS programs at four-year colleges in the U.S. This comparison determines whether the societal costs exceed the benefits or the benefits exceed the costs at three groups of successful SSS projects, the most effective 45%, (with a graduation rate of at least 36.6%) the most effective 40% (with a graduation rate of at least 39.1%) and the most effective 32% of all SSS projects (with a graduation rate of at least 44.1%) that reported a graduation rate in project year 2005-2006. The cost and benefit measures included in this analysis are listed in Table 9 on the following page:

Table 9
Cost and Benefit Measures of Higher-Impact SSS Projects

Monetary Value of Cost Measures	**compared to**	Monetary Value of Benefit Measures
SSS Grant Awards		Increased Federal Income Tax Receipts
SSS Host Institution Contributions		Decreased Health Care Costs: Federal Costs of Medicaid Enrollment
Department of Education Oversight of SSS		Decreased Crime Costs: Costs of Federal Prison Incarceration
Higher Stafford Loan Subsidies and Pell Grants		

In order to compare the benefits and costs, it is necessary to identify the value of the cost measures and benefit measures for higher-impact SSS projects. For ease of discussion, the "higher-impact" projects will be divided into three groups: (1) modest-impact (or modestly effective) SSS projects with a graduation rate of at least 36.6%, moderate-impact (or moderately effective) SSS projects with a graduation rate of at least 39.1% and high-impact (or highly effective) SSS projects with a graduation rate of at least 44.1%.

Calculating Societal Costs of Modest, Moderate and High-Impact SSS Projects

Grant Awards and Institution Contributions

The total cost of grant awards for the SSS projects considered in this analysis is as follows in Table 10:

Table 10
Grant Award and Institutional Contribution Costs of Higher-Impact SSS Projects

Number of Higher-Impact SSS Projects	Total Grant Award + 14% for Institutional Contributions = Total Grant Award + Institutional Contributions
164 projects with a graduation rate of at least 36.6%	$51,832,813 + $7,256,594 = $59,089,407
146 projects with a graduation rate of at least 39.1%	$45,693,241 + $6,397,054 = $52,090,295
116 projects with a graduation rate of at least 44.1%	$36,472,474 + $5,106,146 = $41,578,620

Source: U.S. Department of Education, SSS Project Award Data, 2005-2006.

To each of the SSS project grant award cost measures listed above, a second cost measure to account for institutional contributions has been added. While this number is difficult to estimate, one profile of SSS estimated that institutions contribute a total of 14% of the SSS grant award (Cahalan, Muraskin & Goodwin, 1994) to account for the additional costs contributed (primarily as institutional overhead) by institutions that host the SSS projects. While this estimate may be high, it is unlikely that institutions contribute more

than 14% of the grant award to their SSS projects, and at least one SSS project director indicated that institutions likely contribute less than 14% of the total grant award (Interview with SSS Project Director, April 2009). As previously mentioned, including 14% of the grant award for this measure ensures that all institution contributions are accounted for in this benefit-cost analysis.

Department of Education Oversight of Higher-Impact SSS Projects

The third cost measure in this analysis is the personnel cost of oversight from the Department of Education. This was calculated by adding together the salaries of each staff member on the team that oversees the SSS program. There are 14 staff members of the College and University Preparation Team with a combined annual salary of $1,505,000 (U.S. Department of Education, Office of Postsecondary Education, Executive Office, 2009). However, this team oversees not only SSS grants, but also the Ronald E. McNair Postbaccalaureate Achievement grants and Childcare Access grants. However, the size of the SSS program dwarves the other two programs, and an average of 73% of the grants overseen by the College and University Preparatory Team are SSS grants. Therefore, 73% of their combined annual salaries ($1,098,650) will be used as a cost measure in this study.

In addition, a portion of the cost of the senior management team and the program management and development team is added to this total because each staff member on the senior management team spends an estimated 36.5% of their time working with the College and University Preparation Team on SSS program issues. 36.5% of the salary for these staff members equals $400,040 (U.S. Department of Education, Office of

Postsecondary Education, Executive Office, 2009). Payroll costs for oversight of the SSS program equal $1,098,650 + $400,040 = $1,498,690.

Finally, the costs for office space ($111,427), benefits ($226,464), and costs for supplies and equipment ($30,077) combine for a total of $367,968 (U.S. Department of Education, Office of Postsecondary Education, Executive Office, 2009). Therefore, the total cost of oversight of the SSS program for the 2005-2006 grant year by the Department of Education equals $1,866,658. That total of $1,866,658 is for Department of Education oversight of 959 grant awards at 2-year and 4-year colleges across the country. The average cost of oversight per grantee for the 2005-2006 grant year is $1,866,658 / 959 = $1,946. This average oversight cost is used to calculate the oversight costs for the higher-impact SSS projects at 4-year colleges and universities that are the focus of this analysis, as indicated in Table 11 below:

Table 11
Costs of Department of Education (ED) Oversight of Higher-impact SSS Projects

Payroll Costs	$1,498,690
Benefit Costs	$226,464
Office Space Rental	$111,427
Technology, Supplies and Equipment	$30,077
Total Costs of ED Oversight of SSS:	$1,866,658
Divided By the Number of SSS projects at 2-year and 4-year colleges nationwide	959
Total Average Cost for ED Oversight per SSS project	$1,946
Graduation Rate of 36.6% = 164 awards ($1,946) =	$319,144
Graduation Rate of 39.1% = 146 Awards ($1,946) =	$284,116
Graduation Rate of 44.4% = 116 awards (1,946) =	$225,736

Source: Office of Postsecondary Education, Executive Office (2009).

Higher Stafford Loan Subsidies and Pell Grant Costs

The final cost measures that are calculated are the additional costs the Department of Education accrues for Pell Grants and Stafford Loans as a result of higher persistence rates that precede the higher graduation rates at the 164 higher-impact SSS projects that are the focus of this benefit-cost analysis. Nationally, 28 percent of all undergraduates receive a Stafford Loan, but 99 percent of low-income students received a Stafford Loan in 2003-04. While there was no data available for 2005-2006, historically this number has been very consistent over time. The average student loan was $3,200 for dependent students and $3,300 for independent students (IES, 2008, p.8 and 12), and the average cost to the government of subsidizing these loans is $1,000 over 5 years (IES, 2008, p. 17) or $200 per year. Since 75.6% of students (Zhang & Chen, 2007) are low-income and 99% of low-income students receive Stafford loans (Wei & Berkner, 2008), this study assumes that 100% of SSS participants receive a subsidized Stafford loan and are eligible for the annual federal Stafford Loan subsidy of $200 per year. This estimate is probably a bit higher than the actual Stafford Loan recipient rate for SSS participants, but it ensures that all Stafford loan costs are captured in this analysis. Therefore, the cost of Stafford Loan subsidies at each graduation rate is listed on the next page in Table 12:

Table 12
Stafford Loan Subsidies for Moderate, Modest and High-Impact SSS Projects

36.6% graduation rate = 40,117 SSS participants ($200) =	$8,023,400
39.1% graduation rate = 35,372 SSS participants ($200) =	$7,074,400
44.1% graduation rate = 28,467 SSS participants ($200) =	$5,693,400

Source: (IES, 2008).

The average Pell Grant is calculated for 75% of SSS participants based on data derived from the Beginning Postsecondary Students Longitudinal Survey (BPS), 74.1% of LIFG students receive a Pell grant, and a majority of SSS participants (62%) (SSS APR Data, 2005-2006) are LIFG students. This study uses the average Pell grant award amount for 2005-2006 which is $2,456 (Miller, 2007). Pell Grant costs at each level of impact are summarized in Table 13 below:

Table 13
Pell Grant Costs for Modest, Moderate and High-Impact SSS Projects

Modest Impact Projects[a]	40,117 participants (.75) = 30,087 participants 30,087 ($2,456) =	$73,893,672
Moderate Impact Projects[b]	35,372 participants (.75) = 26,529 participants 26,529 ($2,456)	$65,155,224
High Impact Projects[c]	28,467 participants (.75) = 21,350 participants 21,350 ($2,456) =	$52,435,600

[a]45% of all SSS Projects – at least a 36.6% Graduation Rate
[b]40% of all SSS Projects – at least a 39.1% Graduation Rate
[c]32% of all SSS Projects – at least a 44.1% Graduation Rate
Source: (Miller, 2007)

The total costs of the SSS program at each graduation rate are summarized in Table 14:

Table 14
Total Costs – Modest, Moderate and High-Impact SSS Projects

	Modest Impact SSS Projects	Moderate Impact SSS Projects	High Impact SSS Projects
Total SSS Grant Awards	$51,832,813	$45,693,241	$36,472,474
Institution Contributions	$7,256,594	$6,397,054	$5,106,146
SSS Oversight by ED	$319,144	$284,116	$225,736
Federal Stafford Loan Subsidy Costs	$8,023,400	$7,074,400	$5,693,400
Federal Pell Grant Costs	$73,893,672	$65,155,224	$52,435,600
Total SSS Project Costs	**$141,325,623**	**$124,604,035**	**$99,933,356**

This benefit-cost analysis compares the costs for additional graduates attributable to SSS with the additional benefits generated by the SSS graduates in modest, moderate and high-impact SSS projects. In order to do this, it is necessary to calculate the additional costs per graduate, which is completed below for each graduation rate.

The modestly effective SSS projects that realize a graduation rate of at least 36.6% (a 2.5% increase over the average LIFG graduation rate of 34.1%) include 164 SSS grant projects with 40,117 students. As calculated above, the total SSS project costs including total grant awards, indirect costs, SSS oversight, and additional Stafford Loan

subsidy and Pell Grant costs amount to $141,325,623. For the purposes of this benefit-cost analysis, we calculate the must arrive at a total average cost per graduate. Of the 40,117 students who participate in SSS projects with a graduation rate of at least 36.6%, a total of 14,682 graduated with a bachelor's degree, so the average cost per graduate in these programs is $9,626 (141,325,623/14,682 graduates = $9,626 per additional graduate). An additional 2.5%, or 1,003 SSS participants graduated in these SSS programs than would have graduated at the typical graduation rate for LIFG students of 34.1%. The total cost for these graduates is $9,654,878 ($9,626 x 1,003 additional graduates). Table 15 on the following page summarizes these calculations:

Table 15
Modestly Effective SSS Projects with a Graduation Rate of at least 36.6%
2.5% higher than the average LIFG graduation rate of 34.1%

Total Costs		$141,325,623
Total Participants		40,117
Total Graduates	40,117 participants (36.6%) =	14,682
Average Cost per Graduate	$141,454,527 / 14,682 graduates =	$9,626
Number of Additional Graduates due to Higher Graduation Rate	40,117 participants (2.5%) =	1,003
Total Costs for Additional Graduates	1,003 additional graduates ($9,626) =	$9,654,878

Source: U.S. Department of Education, Office of Postsecondary Education and Author's calculations.

The moderately effective SSS programs that realize a graduation rate of at least 39.1% (a 5% increase over the average LIFG graduation rate of 34.1%) include 146 SSS grant projects with 35,372 students. As calculated above, the total SSS project costs including total grant awards, indirect costs, SSS oversight and additional Stafford Loan subsidy and Pell Grant costs amount to $124,604,035. Of the 35,372 students who participate in SSS projects with a graduation rate of at least 39.1%, a total of 13,830 graduated with a bachelor's degree, so the average cost per graduate in these programs is $9,010 ($124,604,035/13,830 graduates = $9,010 per graduate). An additional 5%, or 1,769 SSS participants graduated in these SSS programs than would have graduated at the typical graduation rate for LIFG students of 34.1%. The total cost for these graduates

is $15,938,690 ($9,010 x 1,769 additional graduates). Table 16 below summarizes these calculations:

Table 16
Moderate Impact SSS Projects with at least a 39.1% Graduation Rate
5% higher than the average LIFG graduation rate of 34.1%

Total Costs		$124,604,035
Total Participants		35,372
Total Graduates	35,372 participants (39.1%) =	13,830
Average Cost per Graduate	$124,717,991 / 13,830 graduates =	$9,010
Number of Additional Graduates due to Higher Graduation Rate	35,372 participants (5%) =	1,768
Total Costs for Additional Graduates	1,768 additional graduates ($9,010) =	$15,938,690

The highly effective (high impact) SSS projects that realize a graduation rate of at least 44.1% (a 10% increase over the average LIFG graduation rate of 34.1%) include 116 projects with 28,467 students. As previously calculated, the total SSS project costs including total grant awards, indirect costs, SSS oversight, and additional Stafford Loan subsidy and Pell Grant costs equals $99,933,356. Of the 28,467 students who participated in SSS projects with a graduation rate of at least 44.1%, a total of 12,554 of those students graduated with a bachelor's degree. For the purposes of this benefit-cost analysis, we must calculate the average cost per graduate. An average cost per graduate

for these 116 high-impact SSS projects is $7,960 ($99,933,356/12,554 graduates = $7,960 per graduate). An additional 10%, or 2,847 SSS participants graduated in these SSS programs than would have graduated at the typical graduation rate for LIFG students of 34.1%. The total cost for these graduates is $22,662,120 ($7,960 x 2,847 additional graduates). Table 17 below summarizes these calculations:

Table 17
High-Impact SSS Projects with a Graduation Rate of at least 44.1%
10% higher than the average LIFG graduation rate of 34.1%

Total Costs		$99,933,356
Total Participants		28,467
Total Graduates	28,467 participants (44.1%) =	12,554
Average Cost per Graduate	$100,024,532 / 12,554 graduates =	$7,960
Number of Additional Graduates due to Higher Graduation Rate	28,467 participants (10%) =	2,847
Total Costs for Additional Graduates	2,847 additional graduates ($7,960) =	$22,662,120

The sum of cost estimates at the graduation rates of 36.6%, 39.1% and 44.1% are compared to the sum of benefits estimates at each of those graduation rates and a benefit-cost ratio is calculated for the value of costs compared to the value of benefits at each of these graduation rates. Table 18 on the following page provides a summary of cost estimates at the three graduation rates:

Table 18
Summary of Societal Cost Measures for Modestly, Moderately and Highly Successful SSS Projects
Graduation Rates of at least 36.6%, 39.1% and 44.1% 2005-2006 Project Year

	Programs with a graduation rate of at least 36.6%	Programs with a graduation rate of at least 39.1%	Programs with a graduation rate of at least 44.1%
Total Costs	$141,454,527	$124,717,991	$100,024,532
Total SSS Participants	40,117	35,372	28,467
Total SSS Graduates	14,682	13,830	12,554
Average Cost per SSS Graduate	$9,626	$9,010	$7,960
Additional Graduates due to Higher SSS Participation	1,003	1,768	2,847
Total SSS Project Costs For Additional Graduates	$9,654,878	$15,938,690	$22,662,120

The total costs for additional graduates increases, but this increase is due to the fact that as the percentage of graduates increases, the total number of graduates also increases.

Calculating the Societal Benefits of Modest, Medium and High-Impact SSS Projects

Increased Income Tax Receipts

The cost estimates calculated above are compared to benefits measures for each of the three target graduation rates within this group of moderate, medium and high-impact SSS projects. The first societal benefit measure is increased tax receipts due to bachelor's degree completion. To calculate this figure, it was necessary to extrapolate earnings for the 40-year working life of college graduates, estimate the amount of taxes these graduates will pay and discount the value of future earnings. The figures below are given in 2005 dollars. The typical expected earnings over the working lives of bachelor's degree recipients is $2,058,380 as compared to lifetime earnings of $1,518,300 for students with some college, but no degree, a difference of $540,080. Using a discount rate of 3%, this amount is approximately $311,577. Using a discount rate of 7%, this amount is equal to $177,691 and using a discount rate of 10%, this amount is equal to $128,679. At an annual tax rate of 15%, over a 40-year working life, the typical expected tax receipts are $311,577 (.15) = $46,737 at a 3% discount rate, $177,691 (.15) = $26,654 at a discount rate of 7%, and $128,679 (.15) = $19,302 at a discount rate of 10%. Table 19 summarizes these benefits:

Table 19
Increased Earnings for Bachelor's Degree Recipients, Compared to Students With Some College, But No Degree
2005 Dollars

	Discount Rate			
	Undiscounted	3%	7%	10%
Increased Earnings	$540,080	$311,577	$177,691	$128,679
Increased Federal Taxes (at a 15% tax rate)	$81,012	$46,737	$26,654	$19,302

Source: U.S. Census Bureau (2005) and Author's Calculations

The increased earnings in Table 19 above will be used to calculate the increased federal tax receipts for modest, moderate and high-impact SSS projects. Among the "modestly effective" programs with a graduation rate of at least 36.6%, that served 40,117 participants, the difference in number of graduates due to the SSS project is approximately 2.5% of the total 40,117 participants in these projects, amounting to 1,003 additional college graduates. Using a tax rate of 15% for these 1,003 graduates, expected tax receipts at a 3% discount rate is $46,877,211 ($46,737 x 1,003 additional graduates). At a discount rate of 7%, expected tax receipts are $26,533,362 ($26,654 x 1,003 additional graduates) and at a discount rate of 10%, expected tax receipts are $19,359,906 ($19,302 x 1,003 additional graduates).

Among the "moderately effective" programs with a graduation rate of at least 39.1%, that served 35,372 participants, the difference in the number of graduates due to

the SSS project is 5% of the total 35,372 participants in these projects, amounting to 1,768 additional college graduates. Using a tax rate of 15% for these 1,768 graduates, at a discount rate of 3%, the total increase in tax receipts is $82,631,016 ($46,737 x 1,768 additional graduates). At a discount rate of 7%, the total expected increase in tax receipts is $47,124,272 ($26,654 x 1,768 additional graduates) and at a discount rate of 10%, the total expected increase in tax receipts as a result of higher bachelor's degree completion rates is $34,125,936 ($19,302 x 1,768 additional graduates).

Among the "highly effective" projects with a graduation rate of at least 44.1%, and served 28,467 participants, the difference in the number of graduates due to SSS is 10% of the total 28,467 participants, amounting to 2,847 additional college graduates. Using a tax rate of 15% for these 2,847 graduates, expected tax receipts at a 3% discount rate are $133,060,239 ($46,737 x 2,847 additional graduates). At a discount rate of 7%, the expected increase in tax receipts is $75,883,938 ($26,654 x 2,847 additional graduates) and at a discount rate of 10%, the total expected increase in tax receipts is $54,952,794 ($19,302 x 2,847 additional graduates). Table 20 summarizes these benefits:

Table 20
Increased Federal Income Tax Receipts Due to Increased Bachelor's Degree Graduation Rates

	Discount Rate		
	3%	7%	10%
Modestly Effective Projects with a Graduation Rate of at least 36.6%	$46,877,211	$26,533,362	$19,359,906
Moderately Effective Projects with a Graduation Rate of at least 39.1%	$82,631,016	$47,124,272	$34,125,936
Highly Effective Projects with a Graduation Rate of at least 44.1%	$133,060,239	$75,833,938	$54,952,794

Source: U.S. Census Bureau (2005) and Author's Calculations

Decreased Healthcare Costs

The second benefit measure is the reduction in Medicaid costs related to completing a bachelor's degree. The 2005 mean cost for Medicaid recipients was $7,696 (Belfield & Levin, 2007), and in 2005, the percentage of students who have some college but no degree that participated in Medicaid is 15%. In contrast, 6% of students with a bachelor's degree participated in Medicaid in 2005 (Mortenson, 2007; Baum & Ma, 2007).

Among the modestly effective programs with a graduation rate of at least 36.6%, 40,117 of the students involved in SSS graduated, and as calculated above, the modestly impacted SSS projects yielded 1,003 additional graduates and 15% of them, or 150

students, would have been Medicaid recipients at a federal Medicaid cost of $1,085,136 if they had not graduated. This number must be adjusted downward since only 6% of college graduates receive Medicaid. In this case, 60 of the 1,003 additional college graduates would still be on Medicaid, resulting in an 85-person decrease in Medicaid enrollment as a result of the modestly effective SSS projects. Given the average annual Medicaid costs of $7,696, this would translate into an additional annual federal Medicaid cost savings of $654,160. This study makes the assumption that the difference in Medicaid enrollment rates for students with some college compared to students with a bachelor's degree will remain consistent over the next 40 years, and that these rates will remain at 15% enrollment (for students with some college) and 6% enrollment (for students with a bachelor's degree).

In addition, this study makes the assumption that federal Medicaid costs will continue to increase at an annual rate of 7.4%. This assumption is the result of studies that project Medicaid expenditures to grow at that rate (Center for Medicare and Medicaid Services, 2009). Some other studies project that Medicaid spending could grow at a slightly higher rate of 7.9% (Truffer, Klemm, Hoffman & Wolfe, 2008) or even at a much higher rate of 8.5% per year (Borger, Smith, Truffer, Keehan, Sisko, Poisal & Clemens, 2006). Because benefits are forecast over the next 40 years, a rather conservative estimate of 7.4% growth allows for policy changes or health care advances that may reduce Medicaid expenditures in the future.

This study also assumes that each Medicaid recipient is on Medicaid for a total of 6.4 years over a 40-year working life. This estimate is based on the fact that approximately 16% of the U.S. population is enrolled in Medicaid annually (MEPS,

2006), and over a 40-year working life, this 16% rate of enrollment of per year equals a total of 6.4 years. Forty-one percent of the Medicaid enrollment savings are distributed between the ages of 25 and 44 and the remaining 59 percent are distributed between the ages 45 and 65, in alignment with average Medicaid costs during those years of life (U.S. Department of Health and Human Services, 2006).

These annual federal Medicaid expenditure savings are calculated for each of the following 40 years at three different discount rates. At a 3% discount rate, the Medicaid expenditure cost savings of modestly effective programs are $4,743,678, at a 7% discount rate, the Medicaid expenditure cost savings for moderately effective programs are $2,464,044 and at a 10% discount rate, the Medicaid expenditure cost savings for highly effective programs are $1,698,894.

Among the moderately effective projects with a graduation rate of at least 39.1%, 35,372 were served, and as calculated above, these projects yielded 1,768 additional graduates and 15% of them or 265 students would have been Medicaid recipients. The number must be adjusted downward since only 6% of college graduates receive Medicaid. In this case, 106 of the 1,768 additional college graduates would still be on Medicaid, resulting in a 159-person decrease in Medicaid enrollment as a result of the modestly effective SSS projects and a cost savings in federal Medicaid enrollment of $1,223,664. At a 3% discount rate, and a 7% rate of annual growth, the Medicaid expenditure cost savings of moderately effective SSS projects is $8,873,475, at a 7% discount rate, the Medicaid expenditure cost savings are $4,609,208 and at a 10% discount rate, the Medicaid expenditure cost savings are $3,177,925.

Among highly effective SSS projects with a graduation rate of at least 44.1%, 28,467 students were served and as calculated above, the high-impact SSS projects yielded 2,847 additional graduates and 15% of them or 427 students would have been Medicaid recipients. This number must be adjusted downward since 6% of college graduates receive Medicaid. In this case, 171 additional college graduates would still be on Medicaid, resulting in a 256-person decrease in Medicaid enrollment as a result of highly effective SSS projects. Given the average annual Medicaid costs of $7,696, this would translate into an additional federal Medicaid cost savings of $1,968,176. The Medicaid expenditure cost savings of highly effective SSS projects over a 40 year working life at a 3% discount rate and an annual growth rate of 7.4% are $14,860,160, at a 7% discount rate, the Medicaid expenditure cost savings are $7,813,474 and at a 10% discount rate, the Medicaid expenditure cost savings are $5,423,059. Table 21 summarizes these cost savings:

Table 21
Federal Medicaid Expenditure Cost Savings Due to Increased Bachelor's Degree Graduation Rates of Modestly, Moderately and Highly Effective SSS Projects

	Discount Rate		
	3%	7%	10%
Modestly Effective Projects with a Graduation Rate of at least 36.6%	$4,743,678	$2,464,044	$1,698,894
Moderately Effective Projects with a Graduation Rate of at least 39.1%	$8,873,475	$4,609,208	$3,177,925
Highly Effective Projects with a Graduation Rate of at least 44.1%	$14,860,160	$7,813,474	$5,423,059

Source: Medical Expenditure Panel Survey and Author's Calculations.

Reduced Cost of Crime

The third benefit measure included in this benefit-cost analysis is the reduced cost of crime due to an increased rate of degree completion as a result of the high- impact SSS projects that are the focus of this study. Federal incarceration rates are 16% for students with some college and 8.1% for students who graduate from college (Harlow, 2003). The average prison sentence in the United States is 5 years (U.S. Department of Justice, 2008) and this study uses a 5-year prison sentence. Because research indicates that 60% of arrests happen by age 28 (Barnett, 1996), this study assumes that 60% of cost savings occur between the ages of 25-30, the most common ages for a person with a bachelor's

degree to be incarcerated (Lochner & Moretti, 2004). Of the remaining 40% of federal incarceration cost savings, half of it, or 20% is distributed between the ages of 30-35, the second most common age period in which persons with a bachelor's degree are incarcerated (Lochner & Moretti, 2004) and the remaining 20% is distributed in even increments for the remaining 30 years of an individual's working life. The annual costs for federal incarceration were $22,632 in 2004 dollars and these costs and these cost savings are calculated at an annual growth rate of 11%, the growth rate of federal incarceration costs in the United States (Hughes, 2006).

Modestly effective SSS projects with a graduation rate of at least 36.6% had 40,117 students, and as calculated previously, modest impact SSS projects yielded 1,003 additional graduates and this number must be adjusted downward since 8.1% of college graduates are incarcerated in federal prisons (Harlow, 2003). Had these 1,003 students not graduated, 16% of them or 160 of these students would have been incarcerated. In this case, 80 additional college graduates (1,003 additional college graduates x .081) would be incarcerated in federal prisons, resulting in an 80-person decrease in federal prison incarceration as a result of modestly effective SSS projects. This reduction results in total cost savings of $9,052,800 (U.S. Department of Justice, 2008). Research indicates that 60% of arrests happen by age 28 (Barnett, 1996), so this analysis places 60% of the total benefits, or $9,052,800 (.60) = $5,431,680 and assigns it in even amounts of 1,086,336 between the ages of 25 and 30. Of the total $9,052,800 cost savings, 20 percent or $1,810,560 is assigned in even amounts of 362,112 for the five years between ages 31 and 35, recognizing that incarceration is more likely to occur at younger ages than at older ages (Barnett, 1996). The remaining 20% of the benefit,

$1,810,560 is assigned evenly over the remaining 30 years of work life, resulting in a distribution of benefit of $60,352 per year ($1,810,560 / 30 years). All cost savings are calculated at an annual growth rate of 11%, the current growth rate of incarceration costs in the United States (Hughes, 2006). Therefore, at a 3% discount rate, total federal incarceration cost savings are $69,124,905. At a 7% discount rate, total federal incarceration cost savings are $48,354,483 and at a 10% discount rate, the total federal incarceration cost savings are $41,225,263.

Among the moderately effective SSS projects with a graduation rate of at least 39.1% and serving 35,372 students, the difference in number of graduates due to the SSS project is 5% (or the percentage between the average LIFG graduation rate and the graduation rate of modestly effective SSS projects) or as calculated above, modest impact SSS projects yield 1,768 additional graduates and 16% of them, or 283 of these students would have ended up incarcerated in federal prisons. This number must be adjusted downward since 8.1% of college graduates are incarcerated in federal prisons, resulting in a 142-person decrease in federal prisoners as a result of moderately effective SSS projects. Given the annual costs of $22,632 per student, and the average prison sentence of 5 years, total incarceration cost savings are $16,068,720 ($32,024,280 - $15,955,560) (U.S. Department of Justice, 2008; Mortenson, November 2007).

Similar to the analysis at a graduation rate of 36.1%, this analysis takes 60% of the total benefits, or $16,068,720 (.60) = $9,641,232 and assigns it in even amounts of 1,928,246 between the ages of 25 and 30. Of the remaining 40% of benefit, half of it is assigned to the years 31 to 35, recognizing that incarceration is more likely to occur at younger ages than at older ages (Barnett, 1996). The remaining 20 percent, or

$3,213,744, is assigned in even amounts of 642,749 for the five years between ages 31 and 35. Recognizing that incarceration does continue throughout life, although at lower levels than when individuals are in their 20's and early 30's, the remaining 20% of the benefit, $3,213,744 is assigned evenly over the remaining 30 years of work life, resulting in a benefit of $3,213,744 distributed in increments of $107,125 per year ($3,213,744 / 30 years). All cost savings are calculated at an annual growth rate of 11%, the current growth rate of incarceration costs in the United States (Hughes, 2006). At a 3% discount rate, total federal incarceration cost savings of moderately successful SSS projects are $122,696,443. At a 7% discount rate, total federal incarceration cost savings are $85,829,145 and at a 10% discount rate, total federal incarceration cost savings are $73,174,818.

Among the highly successful projects with a graduation rate of at least 44.1%, and serving 28,467 students, the difference in number of graduates due to the SSS projects is approximately 10% of the total 28,267 SSS participants in these projects, amounting to 2,870 additional graduates. A total of 16% or approximately 456 of these students would have ended up incarcerated at an annual cost of $22,632 per student for 5 years, for a total of $51,607,800 were it not for the higher graduation rates associated with highly effective SSS projects. In this case, the number must be adjusted downward since only 8% of college graduates are incarcerated in federal prisons, resulting in a reduction of 228 federal prisoners and incarceration cost savings of $25,800,480 (U.S. Department of Justice, 2008; Mortenson, November 2007). Similar to the analysis at a graduation rate of 39.1%, this analysis takes 60% of the total benefits, or $15,480,288 ($25,800,480 x .60) and assigns it in even amounts of 3,096,058 between the ages of 25 and 30. Of the

total cost savings, 20 percent or $5,160,096 is assigned to the years 31 to 35, recognizing that incarceration is more likely to occur at younger ages than at older ages (Barnett, 1996). Because incarceration continues throughout life, although at lower levels than when individuals are in their 20's and early 30's, the remaining 20% of the benefit, $5,160,096 is assigned evenly over the remaining 30 years of work life, resulting in a benefit of $172,003 per year ($5,160,096 / 30 years).

All cost savings are calculated at an annual growth rate of 11%, the current growth rate of incarceration costs in the United States (Hughes, 2006). At a 3% discount rate, total federal incarceration cost savings of highly effective SSS projects are $197,005,904. At a 7% discount rate, total federal incarceration cost savings are $137,810,256, and at a 10% discount rate, the total federal incarceration cost savings are $117,491,995. These results are summarized in Table 22 on the following page:

Table 22
Federal Incarceration Cost Savings Due to Increased Bachelor's Degree Graduation Rates of Modestly, Moderately and Highly Effective SSS Projects

	Discount Rate		
	3%	7%	10%
Modestly Effective Projects with a Graduation Rate of at least 36.6%	$64,804,599	$45,332,329	$38,648,686
Moderately Effective Projects with a Graduation Rate of at least 39.1%	$116,682,784	$81,622,338	$69,588,228
Highly Effective Projects with a Graduation Rate of at least 44.1%	$140,353,930	$98,180,864	$83,705,419

Source: Bureau of Justice Statistics and Author's Calculations.

A summary of benefit measures are provided for three categories of benefit (federal income tax receipts, lower federal Medicaid enrollment costs, and lower federal incarceration costs) at three different discount rates of 3%, 5% and 7% for modestly effective SSS projects with a graduation rate of at least 36.6% in Table 23 on the following page:

Table 23
Summary of Societal Benefit Measures for Additional Graduates
2005-2006 Project Year
Modestly Successful SSS Projects with a Graduation Rate of at least 36.6%
164 Projects / 40,117 Participants / 14,682 Graduates / 1,003 Additional Graduates

	Discount Rate		
Societal Benefit Measures For Additional Graduates	3%	7%	10%
Increase in Federal Income Tax Receipts	$46,877,211	$26,533,362	$19,359,906
Decrease in Healthcare Costs (Medicaid Expenditure)	$4,743,678	$2,464,044	$1,698,894
Decrease in Cost of Incarceration	$69,124,905	$48,354,483	$41,225,263
Total Benefit Measures for additional graduates	**$120,745,794**	**$77,351,889**	**$62,284,063**

A summary of benefit measures are provided for three categories of benefit (federal income tax receipts, lower federal Medicaid enrollment costs, and lower federal incarceration costs) at three different discount rates of 3%, 5% and 7% for a modestly effective SSS projects with a graduation rate of at least 39.1% in Table 24:

Table 24
Summary of Societal Benefit Measures for Additional Graduates
2005-2006 Project Year
Moderately Successful SSS Projects with a Graduation Rate of at least 39.1%
146 Projects / 35,372 Participants / 13,830 Graduates / 1,768 Additional Graduates

	Discount Rate		
Societal Benefit Measures For Additional Graduates	3%	7%	10%
Increase in Federal Income Tax Receipts	$82,631,016	$47,124,272	$34,125,936
Decrease in Healthcare Costs (Medicaid Expenditure)	$8,873,475	$4,609,208	$3,177,925
Lower Cost of Crime	$122,676,443	$85,829,145	$73,174,818
Total Benefit Measures for additional graduates	**$214,180,934**	**$137,562,625**	**$110,478,679**

A summary of benefit measures are provided for three categories of benefit (federal income tax receipts, lower federal Medicaid enrollment costs, and lower federal incarceration costs) at three different discount rates of 3%, 5% and 7% for a highly effective SSS projects with a graduation rate of at least 44.1% in Table 25:

Table 25
Summary of Societal Benefit Measures | 2005-2006 Project Year
Highly Successful SSS Projects with a Graduation Rate of at least 44.1%
116 Projects / 28,467 participants / 12,554 graduates / 2,847 additional graduates

	Discount Rate		
Societal Benefit Measures	3%	7%	10%
Higher Tax Receipts	$133,060,239	$75,883,938	$54,952,794
Lower Healthcare Costs (Medicaid Expenditure)	$14,860,160	$7,813,474	$5,423,059
Lower Cost of Crime	$197,005,904	$137,810,256	$117,491,995
Total Benefit Measures	**$344,926,303**	**$221,507,668**	**$177,867,848**

Benefit-Cost Analysis of Modest, Moderate and High-Impact SSS Projects

This benefit-cost analysis compares the costs for additional graduates of moderate, modest and high-impact SSS projects with the benefits for additional graduates of these same programs. The additional costs at the graduation rates of 36.6% (modestly effective), 39.1% (moderately effective) and 44.1% (highly effective) are summarized in Table 26:

Table 26
Summary of Costs for Additional Graduates at Modestly, Moderately and Highly Effective SSS Projects | 2005-2006 Project Year

	164 SSS Projects with a graduation rate of at least 36.6%	146 SSS Projects with a graduation rate of at least 39.1%	116 SSS Projects with a graduation rate of at least 44.1%
Total Cost	$141,325,623	$124,604,035	$99,933,356
Total SSS Project Costs for additional Graduates	$9,654,878	$15,938,690	$22,662,120

The first benefit-cost analysis compares the societal benefits with the societal costs of modestly effective SSS Projects with a graduation rate of 36.6% that, as noted in the table above, have a total cost for additional graduates of $9,654,878. This cost of $9,654,878 is compared to benefits measures at discount rates of 3%, 7% and 10% listed in Table 27:

Table 27
Benefit-Cost Analysis
Modestly Successful SSS Projects with a Graduation Rate of at least 36.6% | 2005-2006 Project Year
164 Projects / 40,117 Participants / 14,682 Graduates / 1,003 Additional Graduates

	Discount Rate		
	3%	7%	10%
Benefit-Cost Comparison	$120,745,794 $9,654,878	$77,351,889 $9,654,878	$62,284,063 $9,654,878
Benefit-Cost Ratio	12.51	8.01	6.45

The second benefit-cost analysis compares the societal benefits with the societal costs of moderately effective SSS Projects with a graduation rate of 39.1% that, as noted in the table above, have a total cost for additional graduates of $15,938,690. This cost of $15,938,690 is compared to benefits measures at discount rates of 3%, 7% and 10% listed in Table 28:

Table 28

Benefit-Cost Analysis
Moderately Successful SSS Projects with a Graduation Rate of at least 39.1% | 2005-2006 Project Year
146 Projects / 35,372 Participants / 13,830 Graduates /1,768 Additional Graduates

	Discount Rate		
	3%	7%	10%
Benefit-Cost Comparison	$214,180,934 $15,938,690	$137,562,625 $15,938,690	$110,478,679 $15,938,690
Benefit-Cost Ratio	13.44	8.63	6.93

The third benefit-cost analysis compares the societal benefits with the societal costs of moderately effective SSS projects with a graduation rate of 44.1% that, as noted in the table above, have a total cost for additional graduates of $22,662,120. This cost of $22,662,120 is compared to benefits measures at discount rates of 3%, 7% and 10% listed in the Table 29:

Table 29
Benefit-Cost Analysis
Highly Successful SSS Projects with a Graduation Rate of at least 44.1% | 2005-2006 Project Year
116 Projects / 28,467 participants / 12,554 graduates / 2,847 additional graduates

	Discount Rate		
	3%	7%	10%
Benefit-Cost Comparison	$344,926,303 $22,662,120	$221,507,668 $22,662,120	$177,867,848 $22,662,120
Benefit-Cost Ratio	15.22	9.77	7.84

For all three graduation rate measures, 36.6%, 39.1% and 44.1%, the societal benefit measures exceed the societal cost measures of modestly, moderately and highly successful SSS projects. A comparison of the benefit-cost analyses is included in the Table 30:

Table 30
Comparison of Benefit-Cost Ratios for Modestly, Moderately and Highly Effective SSS Projects
Graduation Rates of 36.6%, 39.1% and 44.1%

	Discount Rate		
	3%	7%	10%
Benefit-Cost Ratio at a Graduation Rate of at Least 36.6%	12.51	8.01	6.45
Benefit-Cost Ratio at a Graduation Rate of at Least 39.1%	13.44	8.63	6.93
Benefit-Cost Ratio at a Graduation Rate of at Least 44.1%	15.22	9.77	7.84

The size of the benefit decreases as the discount rate applied to future benefits increases, but even at the highest discount rate of 10%, the benefits of these higher-impact SSS projects outweigh the costs at all three graduation rates. At the highest discount rate and the lowest effectiveness level, an investment of $1.00 translates into a $6.45 return over the course of a lifetime.

Conclusion

This chapter presented the results of the benefit-cost analysis of higher-impact SSS projects. For all three groups of "effective" programs, (36.6%, 39.1% and 44.1%

graduation rates) and at every discount rate (3%, 7% and 10%), the benefits outweighed the costs for these SSS projects. For a dollar invested, the lifetime payoff to society ranges from $6.45 (the least effective group at the highest discount rate) to $15.22 (the most effective group at the lowest discount rate). One notable factor is the fact that as the graduation rate and the number of graduates increases, from 36.6% to 39.1% to 44.1%, the cost per graduate becomes lower, from $9,626 per graduate (at 36.6% graduation rate) to $9,010 per graduate (at 39.1% discount rate) to $7,960 per graduate (at 44.1% graduation rate). These differences are detailed in Table 31 below:

Table 31
Comparison of Actual Cost and Benefit Measures for SSS Projects
7% Discount Rate

	Graduation Rate		
	36.6%	39.1%	44.1%
Cost Per Graduate	$9,626	$9,010	$7,960
Percent Decrease in Cost Per Graduate as Graduation Rate Increases	N/A	6.6%	12.7%

As is evident in Table 31, the actual cost per graduate decreases as the graduation rate (and thus the efficiency) of the SSS projects increases. Therefore, a worthwhile future goal for the SSS program is to raise graduation rates of its projects, so that the costs per graduate decrease and benefit measures, both to the individual and to society, increase.

In addition, marginal graduation rate increases could make a significant difference in the costs per graduate of the SSS program. For example, if all of the higher-impact SSS projects that have a graduation rate of 39.1% were able to raise their graduation rates, this would lower the average cost per graduate significantly. A summary of those calculations is included in Table 32 below:

Table 32
COSTS PER GRADUATE | 2005-2006 SSS Project Year
164 SSS Projects / 40,117 Participants

	Graduation Rate	Increased Graduation Rate	
Cost Measures	36.6%	44.1%	50%
Total Cost Measures	$141,454,527	$141,454,527	$141,454,527
Number of Graduates	14,682	17,691	20,058
Cost Per Graduate	$9,634	$7,995	$7,052
Decrease In Cost Per Graduate		$1,639	$943
Percent Decrease in Cost Per Graduate	N/A	17% decrease	12% decrease

As shown in Table 32, raising the graduation rate of higher-impact SSS projects that currently graduate 36.6% of their participants by 7.5 percent to 44.1% results in a savings of over $1,600 per graduate and increasing the graduation rate by another 5.9% from 44.1% to 50% decreases the cost per graduate by another $943. Increasing the graduation

rate from 36.6% to 50% decreases the cost per graduate by 29%, a significant cost savings.

Table 32 demonstrates that small changes in the performance profile of SSS projects, specifically the graduation rate of participants, can decrease the cost per graduate significantly. Therefore, to make SSS projects more cost-effective, efforts could be made to focus on increasing graduation rates for SSS participants.

Benefits of Higher-Impact SSS Projects Exceed SSS Program Costs

While this benefit-cost analysis focuses only on the top 45% of SSS projects in terms of graduation rates, the financial benefits from the top 45% of SSS projects, using the middle discount rate of 7%, cover nearly all of the grant award costs of SSS projects at 4-year colleges and universities for the 2005-2006 project year. In project year 2005-2006, the total grant award costs for SSS projects at 4-year institutions was $135, 284,548 (U.S. Department of Education, 2009). By subtracting the grant award costs of $51,382,813 for the 164 higher impact SSS projects included in this analysis, a total grant award cost of $83,901,735 remains.

Including the benefit measure for the 1,003 additional graduates that result from SSS projects with a graduation rate of at least 36.6%, a benefit of $77,351,889 is produced and this covers 92% of grant award costs for the other 55% of SSS projects with lower graduation rates. Only the costs for 25 SSS projects would not be covered by the benefits generated by modestly successful projects. When the benefits measure is expanded to include the 146 projects that achieved a graduation rate of at least 39.1%,

total benefits of 137,562,625 exceed the grant costs of all SSS projects. Expanding the benefits measure further to include the 116 projects that achieve a graduation rate of 44.1%, the benefits equal 221,507,668, over 2.5 times the grant award total of SSS projects at 4-year colleges and universities.

While it is noteworthy that the benefits from the higher impact projects that are the focus of this benefit-cost analysis nearly cover the grant award costs of the less effective SSS projects at 4-year colleges and universities across the country, this should not indicate satisfaction with the status quo. Future efforts should evaluate SSS projects that have graduation rates that exceed the national average, determine which components of those projects account for the higher graduation rates achieved by these projects, and make an effort to include those components in the implementation of less effective SSS projects in hopes of raising their graduation rates above the national average.

CONCLUSION

CHAPTER 5

Introduction

Because this benefit-cost analysis rests primarily on the belief that the economic benefits of a bachelor's degree will continue for the foreseeable future, this chapter begins with a discussion of human capital theory and its historical role in helping to explain the economic benefits of a bachelor's degree. Following that, the chapter highlights the need to focus on low-income and first generation students to ensure that the United States produces enough human capital to remain economically competitive. The chapter next addresses the fear of higher education saturation, the predicted ability of the bachelor's degree to continue to accrue positive economic returns, and future research on SSS (and programs like it) that could occur as a result of this study. This discussion includes suggestions for expanding the benefit-cost analysis work done in this study, and suggestions for improving data sources so that future cost analyses have the benefit of better data. In addition, the argument for greater cost analysis research of education programs and policies is addressed. Following that, the Pareto Principle is revisited in reference to the SSS program and final thoughts are provided on the critical role of higher education in American society.

The Economic Benefits of a Bachelor's Degree

Education is an investment in humans that produces human capital (Becker, 1964; Schultz, 1972). The term "capital" is used because this investment can generate a return, just like an investment in new equipment, new buildings or new land. Investments in human capital through education and training enable humans to acquire skills and knowledge that allow them to generate a stream of earnings that would not be possible without the investment (Douglass, 1977; Bowen 1997). For much of the 20th century, a high school diploma provided many Americans with the skills and knowledge that they needed to produce a stream of earnings that allowed their standard of living to increase beyond that of their parents and over their lifetime (Becker, 1964; Schultz, 1972; Bowen, 1997; Belfield & Levin, 2007). In the 21st century, based on current and future projected labor market needs, a bachelor's degree will likely provide the skills and knowledge necessary to gain access to high-skill, high-wage jobs (OECD, 2008).

One of the primary assumptions of this benefit-cost analysis is that the economic returns of a bachelor's degree will remain as they are today for 40 years into the future. While the economic benefits of a bachelor's degree seem assured today, these benefits also seemed assured in the early 1960s, when the differences in average earnings between high school and college graduates was between 40% and 50%, and then rose rapidly for the rest of that decade. However, in the 1970s the earnings differential between high school graduates and college graduates declined sharply (Becker, 1993). This decline led some economists and others to worry about the "overeducated American" (Freeman, 1976; Becker 1993) and according to Nobel Prize winning economist Gary Becker, "the concept of human capital itself fell into some disrepute" (Becker, 1993, p. 17).

Doubt in human capital theory was alarming because Theodore Schultz, Gary Becker and Jacob Mincer all helped develop the argument that an investment in people, primarily in the form of education, but also in health care and related services, yields an economic return in the same way that an investment in physical capital does (Breneman, 1991; Becker, 1993). However, the decline of the earnings difference between high school and college graduates throughout the 1970s threw the theory into question.

History shows that questions about human capital theory were relatively short-lived, however. The fear of overeducated Americans in the 1970s (Freeman, 1976; Becker, 1993) was followed in the 1980s by steep gains in the monetary value of the college education (Murphy & Welch, 1989). In 1979, workers with a bachelor's degree earned roughly 45% more than those with only a high school diploma, and by 1989, wages for college graduates were 70% higher than those for high school graduates (Barrow & Rouse, 2005). The large gains of the 1980s were followed by gains of 10% between high school earnings and college graduate earnings in the 1990s (Barrow & Rouse, 2005), because earnings of college graduates were increasing at the same time the earnings of high school graduates were decreasing due to high-paying blue collar jobs in manufacturing leaving the United States in record numbers (Krueger, 2005; Barrow & Rouse, 2005).

Between the mid-1990s and 2004, the average wages of college graduates rose another 18% (Barrow & Rouse, 2005). These wages increased at the same time that college enrollment continued to increase (Snyder, Tan & Hoffman, 2004; Barrow & Rouse, 2005). Furthermore, as financial gains from having a college education have continued to increase, the fear of "overeducation" has been replaced with a concern that

American students are not getting the education they need to compete in today's global marketplace and the economy of the future (Becker, 1993). Hence, it appears highly unlikely that the economic benefits of a bachelor's degree will cease to exist or decline in coming years. Higher education will remain one of the surest ways to better ones lot in life (Swail, 2000).

While economic indicators support the contention that the financial benefits of a bachelor's degree are likely to continue, there is some debate about whether these economic benefits are due to increases in human capital brought about by increased education levels, or because higher education serves as a screen for capability and a gateway to higher paying jobs. As previously stated, human capital theory contends that higher pay is the result of knowledge and skills acquired through education that lead to higher productivity and higher paying jobs (Becker, 1964; Schultz, 1972; Bowen, 1997; Belfield & Levin, 2007). In contrast, the screening or signaling theory rests on the belief that success at higher education signals to an employer that an individual will be a productive employee, because the traits that make for a productive employee are similar to the traits and abilities of those who get high levels of education (Boesel & Fredland, 1999; Chevalier, Harmon, Walker & Zhu, 2003; van der Werfhorst, 2004). Under the signaling theory, holding a college degree "signals" productivity and thus, it can be used to screen workers (Arrow, 1973; Spence, 1973).

If the human capital model holds, then increasing the education level of a populace will increase economic competitiveness because skills and knowledge gained through education are applied to increase productivity. (Schultz, 1972, Becker, 1993, van der Werfhorst, 2004). The human capital model posits that higher education increases

productivity, while the signaling model says that higher education identifies more productive individuals (Boesel & Fredland, 1999). If the signaling theory holds, increasing the number of people with a bachelor's degree has limited utility because productivity will not increase due to the fact that skills and knowledge are not acquired through higher education. However, both human capital and signaling models agree that those who complete a bachelor's degree are more productive than those who do not (Boesel & Fredland, 1999).

Research that has attempted to determine rather the human capital model or the signaling model more accurately explains the role of higher education in increased productivity and thus, increased earnings has been inconclusive (Boesel & Fredland, 1999; Weiss, 1995). In both models, increasing the education level of LIFG students will have positive effects. Under a signaling model, increasing bachelor's degree completion will make it easier for these students to compete with other students whose wealth or birth to college-educated parents provides an advantage (everything2.com, n.d.). Likewise, under a human capital model, the increased graduation of low-income and first generation students will increase the knowledge and skills available in the workforce, positively impacting productivity. (everything2.com, n.d.).

Revisiting the Pareto Principle

Since this study concludes that the benefits of higher-impact SSS projects far exceed the costs, it seems worthwhile to return to the Pareto principle and determine if these SSS projects also meet the Pareto criteria. Earlier in this study, the Pareto principle was discussed, in terms of the difficulty of ensuring that the main tenet of the Pareto

principle, while some are made better off, nobody is made worse off, is met (Sinden, 1980; Rossi, Lipsey, Freeman, 2004). While the Pareto principle is very difficult, if not impossible to meet, the investment of federal funds in higher-impact SSS projects could satisfy the potential Pareto principle. Trumbull (1990) asserts that "the [Pareto] principle is satisfied when a project results in a movement of resources to more highly valued uses, according to the preferences of those who are affected" (p. 216). One could argue that higher-impact SSS projects do move resources to more highly valued uses because they even out the distribution of income by increasing the long-term earning potential of students from low-income families, and by helping low-income students to avoid becoming low-income adults.

SSS projects also help their participants to overcome the disadvantages that result from low-income and/or first generation status. Many regard it as unfair that a person's prospects should depend on her parent's position in the distribution of advantage. Inequalities of income are sometimes justified, but their being so depends on their being the outcome of a competition played on a more or less level playing field, in which all participants had something approximating equal opportunity for success (Bowles, Gintes & Groves, 2005, p.256). Rawls recognizes that family can hinder the equality of opportunity and in the United States, it currently does. Students who come from low-income families or have parents that are not college educated are less likely to receive a college education. The SSS program, while not a panacea for equity, does help to ensure that for its participants who graduate with a bachelor's degree, higher education will retain its egalitarian effect on the distribution of income in the United States.

Furthermore, participating in higher education can contribute to awareness among low-income students that "customary social stratification is not inevitable" and may help to "motivate privileged groups to work toward reducing inequality" (Bowen, 1997, p. 326). This awareness is important because the support of all in society is required to enable a more equitable distribution of income and a weakening of social stratifications that are often the result of higher education.

The Rationale for the Focus on Low-Income Students

Alisa F. Cunningham, Research Director for the Institute for Higher Education Policy states that "people are concerned about this new wave of students in the next 10-20 years, the vast majority of whom are coming from economically and educationally disadvantaged backgrounds" (Potter, 2003, p. A22). Projections from the U.S. Census Bureau support Cunningham's concern. This generation will be the most ethnically diverse in history. The fastest population growth will come from groups in U.S. society that have traditionally been poorer and more educationally at-risk than the general population (Gladieux & Perna, 2005, p. 24; National Center for Public Policy and Higher Education, 2004). Recent statistics support these predictions. In 1993, 31% of children aged 6-17 were in families earning below 150% of the poverty level ($20,925 in 1993) and in 2005, the number had risen to 38%, or 28 million children ages 6-17 living in low-income families (National Center for Children in Poverty, 2006).

Supporting programs that target low-income and first generation students will be necessary for current and future generations of college-age students (Engle & Tinto,

2008). One reason for low-income and first generation students to pursue higher education is the egalitarian effect that higher education can have on the distribution of income. A key assumption that ensures the continued egalitarian influence of higher education, and one of the key assumptions upon which this benefit-cost analysis is based is that the economic benefits of a bachelor's degree will continue to exist in the future. Closely tied to this premise is the assumption that economic demand for college graduates will continue.

If the United States fails to tap the potential of low-income, first generation and minority students, the future will likely include decreased economic productivity from a workforce that is increasingly uneducated and low-skilled (Carniero & Heckman, 2005; Kirsch, Braum, Yamamoto & Sum, 2007). The decrease in skilled labor will happen at the same time that employment growth in the United States is expected to be driven by professional, management, technical and high-level sales jobs that will "generate about 46% of all job growth between 2004 and 2014" (Kirsch, Braum, Yamamoto & Sum, 2007, p.3). To remain economically competitive, United States leaders and policymakers must make sure that bachelor's degree attainment becomes common for a larger percentage of the American population, extending opportunities to those who have traditionally been excluded.

The Obama administration recognizes the need to maintain a skilled workforce. Since January 2009, the Obama administration has supported increases in Pell Grants, the Federal Perkins Loan program and a restructuring of student loans that should make them more affordable (Department of Education, 2009). These steps could help to put more financial aid into the hands of students from low-income families which is important

because low-income families lack sufficient income and wealth to meet the full costs of higher education, even after contributions from current grant and loan programs (Schultz, 1972; Wei & Berkner, 2008). In addition, the Obama Administration has proposed in its 2009-10 budget a "College Access and Completion Fund" that would spend 2.5 billion over five years on supporting state efforts to boost college completion rates of low-income students (Moltz, 2009).

Higher Education Saturation

A second key assumption of this study and one upon which the future economic benefits of a bachelor's degree depend is that the demand for bachelor's degrees will be maintained at current levels. Some critics of this premise argue that if too many people attain bachelor's degrees, eventually everybody who should have a degree will have a degree. In other words, "at some point as this process continues, the innate abilities that are required to benefit from college work will become exhausted" (Shultz, 1972, pp. 16-17; Bowen, 1997, p. 350). The critics argue that saturation of the market is happening and the economic benefits of a bachelor's degree are decreasing (Barrow & Rouse, 2005).

Saturation of bachelor's degrees in the labor market may be an erroneous concern. Higher education experts estimate that TRIO programs (of which SSS is one of eight different programs that focus on LIFG students) serve no more than 10% of the students who are eligible to receive their services, so more LIFG students could participate (Swail, 2000). While the SSS program reaches out to nearly 200,000 students across the country, the vast majority of whom are low-income and first generation students, the pool of

qualified youth is far greater than the number admitted and enrolled (Haveman & Smeeding, 2006).

In addition, in recent years, the United States has fallen behind other countries in efforts to graduate young adults from college with a postsecondary degree (Anderson & Cook, 2008), a growing percentage of whom are low-income students (Potter, 2003; Carnevale & Rose, 2004). In fact, the United States and Germany stand alone among developed countries in that as of 2002 the average number of adults with a postsecondary degree had fallen (Dynarski, 2005; Haveman & Smeeding, 2006). This statistic of decreasing postsecondary degree attainment can be masked by increases in the number of students going to college over the past decades; but because the number of college dropouts has increased at the same time, the increase in college attendance does not translate into an increase in postsecondary degrees (Dynarski, 2005; Haveman & Smeeding, 2006). Therefore, programs like SSS that work to keep students in college once they get there are critical to future economic growth and research will help to improve the effectiveness of these programs.

Future SSS Research

Peering Into the Black Box

Improving the effectiveness of SSS will involve "peering into the black box" of SSS projects. Peering into the black box will require in-depth study of the SSS projects included in this analysis to determine which SSS project components (or combinations of components) are more or less responsible for producing higher than average graduation rates for this population of LIFG students. One aspect of successful SSS projects that may warrant further study is the idea that SSS programs provide a "home base"

component, meaning the programs provide a place for students to gather to study, socialize and become integrated to their campus. SSS projects that exhibit this quality have demonstrated a higher rate of successful outcomes (Chaney et al., 1997). While providing a "home base" is not officially one of the services offered by SSS, it is apparent that SSS programs that cluster their services together in one or two locations on campus do provide, in these one or two locations, a de facto "home base" for student participants in the SSS program (Muraskin, 1997). It would be difficult to quantitatively measure the positive effects of having a "home base" on students, but it is possible to speculate that the presence of this home base allows students to feel more tied to the institution and to make friends who are in their peer group. These social ties could lead to higher retention.

Participating in peer tutoring in the first year of SSS has consistently demonstrated a positive effect on SSS outcomes such as retention, credits earned and GPA (Chaney et al., 1997). Other commonalities among successful SSS projects include a structured freshman year experience, an emphasis on academic success, extensive student service contacts, targeted participation incentives and a dedicated staff and directors with strong institutional attachments (Muraskin, 1997). Other SSS studies have indicated that successful SSS projects provide computer labs to students, offer specialized SSS courses in study skills, time management and developmental courses, and peer mentoring arrangements wherein students who had been in SSS one year or more advise new students (Furey, 2008). The SSS project at Chicago State University offered developmental courses in math and science, as well as Math and English learning laboratories for its participants (Pinkston-McKee, 1990). A longitudinal study of 30 SSS

sites found that students were more likely to be retained if they participated in SSS instructional courses, peer tutoring and workshops (Chaney et al., 1998).

Future studies of the SSS program also could look closely at SSS projects that have graduation rates below the national average. Just as researchers can learn from successful SSS projects that produce higher than average graduation rates, they can also learn from those SSS projects that produce graduation rates below the national average for this population of students. A comparison between the traits of high graduation rate and low graduation rate SSS projects could help to determine how SSS projects with lower graduation rates might be improved to increase graduation rates for their participants.

In addition, an analysis of how the graduation rates for SSS students at a college or university compare to the graduation rates of other similar students at that institution could reveal that SSS graduation rates are higher than graduation rates for LIFG students at that institution who do not participate in SSS. If the SSS participant graduation rate is higher, it may be possible to demonstrate an economic value for these SSS projects.

As plans are made for future SSS funding, researchers should conduct on-site reviews to examine the components of higher-impact SSS projects such as the projects included in this study, to understand how they contribute to increasing graduation rates. Likewise, researchers could conduct on-site reviews of projects with low graduation rates to determine what components of those projects may negatively affect their graduation rate. An examination of data gathered during these on-site reviews could lead to discoveries that allow a larger number of SSS projects to increase their graduation rates,

achieve greater success for their students, and allow future cost analyses similar to this one to include a larger number of SSS projects.

Researchers should also make an effort to compare SSS to other programs conducted on campuses across the country that work to increase retention and graduation rates of college students. While SSS is the focus of this study, most 4-year colleges and universities have programs of their own that work to ensure that students stay in school and graduate. There may be components of these programs that can be applied to SSS to increase its effectiveness. For example, the GEARUP program, another federal program that helps to ensure student success in college, has a scholarship component that helps to ensure that students have adequate funding for their postsecondary education (Swail, 2000). Likewise, the I Have A Dream™ (IHAD) program provides guaranteed tuition assistance to their participants to ensure that they have financial access to a college education (Arete, 2001). While the SSS program may be the largest program focused on LIFG students, it is not the only program, and a better understanding of other successful programs may result in successful components of other programs being incorporated into the future implementation of SSS.

Differential Effects by Race and Gender

Future research of the SSS program should also address the differing economic benefits of higher education by race and gender. While the future economic benefits of a bachelor's degree seem reasonably assured, the benefits vary according to race and gender. For black males, median earnings for full-time, year-round workers ages 25-64 increased from $31,843 for those with some college but no degree to $38,782 for those who completed a bachelor's degree. For Hispanic females, the increase is even more

significant, from $25,303 to $36,057 and for Asian males (no data for Asian females are available) the increase is equally significant, from $32,490 to $51,330.

While the degree of economic effect brought about by bachelor's degree completion differs for males and females, and for blacks, Hispanics, whites and Asians, and for all males and females of all races, acquiring a bachelor's degree has a positive effect on earnings. Table 33 illustrates the difference, in dollars earned and percentages, for earnings and taxes paid for those with some college, but no degree and those who have completed bachelor's degrees:

Table 33
Total Money Earnings and Estimated Federal Income Taxes Paid by Education Level
2005 Dollars

Earnings	Some College, but No Degree	Bachelor's Degree	Difference in Earnings Bachelor's Degree Minus Some College but no degree
Male			
Hispanic	$33,434	$46,424	$12,990 / 27% difference
Black	$31,843	$38,782	$6,939 / 18% difference
Asian	$32,490	$51,330	$18,840 / 37% difference
White	$36,527	$46,897	$10,370 / 22% difference
Female			
Hispanic	$23,053	$36,307	$13,254 / 37% difference
Black	$21,484	$36,538	$15,054 / 41% difference
White	$25,067	$37,456	$12,389 / 33% difference

Federal Income Taxes (15 % rate)	Some College, but No Degree	Bachelor's Degree	Difference in Federal Income Taxes Paid | Bachelor's Degree minus Some College but no Degree
Male			
Hispanic	$5,015	$6,964	$1,949 / 10% difference
Black	$4,776	$5,817	$1,041 / 18% difference
Asian	$4,874	$7,700	$2,826 / 37% difference
White	$5,479	$7,035	$1,556 / 22% difference
Female			
Hispanic	$3,457	$5,447	$1,990 / 37% difference
Black	$3,223	$5,480	$2,257 / 41% difference
White	$3,760	$5,618	$1,858 / 33% difference

Source: U.S. Census Bureau, 2006, PINC-03

The population of SSS participants in higher-impact SSS projects in project year 2005-2006 is 65% female (26,058 participants) and 35% male (13,956 participants). This disparity affects earnings because although males typically earn more than females, females increase their income by higher percentages than males of the same race as a result of obtaining a bachelor's degree.

Incarceration and health care costs are also affected by gender. The majority of benefits from lower federal incarceration costs come from males because females commit far fewer crimes (Nores et al., 2005; Schweinhart et al., 2005). Among federal inmates in the United States, 93.3% of inmates are male and 6.6% of inmates are female (Bureau of Prisons, 2009). Therefore, the benefits of the SSS program for males exceed those for females on this benefit measure. However, for females, the benefits from Medicaid enrollment savings are greater than for males. In 2007, females comprised 57% of Medicaid enrollees and males made up 43% of Medicaid enrollees (Kaiser, 2009; Schweinhart et al., 2005).

Race also may affect SSS project outcome measures. Blacks and Hispanics comprise 58% of SSS participants; their earnings are typically lower than white and Asian participants. Since this study estimates earnings 40 years into the future, it's likely that the gap in earnings between whites and Asians and blacks and Hispanics will decrease as the United States becomes more diverse. In the last 40 years, the gap in earnings between males and females and between whites, blacks and Hispanics has decreased (U.S. Current Population Survey, 2006). As the United States becomes increasingly diverse, it is likely that the gaps will continue to decrease over the working life of SSS participants in the next 40 years. In addition, it is likely that in the future, the

SSS program will serve even higher numbers of minority participants because minority students will account for all of the growth in the number of high school graduates in the next 15 years (Longanecker, 2008). As this occurs, the SSS program could play a role in expanding opportunity and access to higher paying jobs to minorities in the United States, helping to further decrease the gaps in pay by race. However, for SSS to have an effect that is noticeable on a nationwide scale, it would be necessary for the program to expand to serve a larger percentage of the population. An area of further research that can build on this study could take a closer look at the possible effects of race and gender on SSS projects, and analyze the degree to which these effects will continue into the future.

The Environment As a Factor

While current research identifies components of SSS programs that are most often associated with student success, future research could focus on which services work well in which environments. The SSS program is implemented on nearly 1,000 college and university campuses nationwide. Each project is implemented in a slightly different way from other SSS projects on other college and university campuses across the country. Future research could examine which services are more successful in urban, metropolitan settings, which services account for student success in rural settings, which services are associated with student success at SSS projects at public schools and which factors are most relevant at private schools. Focusing on different subsets of SSS grantees would allow researchers to gather data specific to campus characteristics that may effect which services "count most" in specific environments to helping achieve student success in areas such as retention, credits earned, GPA and graduation.

One place to start this research would be to look closely at several of the SSS projects that were the focus of this study. This study illustrates that the SSS program can have success in graduating its participants at higher than average rates in all types of environments. The environment is not a determinant of success for SSS, but the environment likely does affect the way that an SSS project is implemented. Due to the large financial benefit of these projects, this benefit-cost analysis can serve as a catalyst for further research into what policies and practices result in success for these higher-impact SSS projects. Notably, these projects are not tied to one area of the country, one type of institution, or one size program. The projects that are the focus of this study are implemented at public and private colleges and universities, in metropolitan and rural settings (from New York City to Ripon, WI). The projects range in size from fairly large (745 participants) to fairly small (99 participants). Like the projects, the institutions that host these projects vary in size as well, from a large school like the University of Illinois/Champaign (30,695 students) to smaller schools like Paul Quinn College (565 students) and Lane College of Tennessee with nearly 1,800 students (Burke, 2009). Because these higher-impact SSS projects have been successful in graduating their participants at rates higher than the national average for LIFG students, and they have done so in a wide variety of settings with a wide variety of students from many different backgrounds, lessons learned from these programs might be applied to other SSS projects. These lessons could be applied not only to help students elsewhere, but to enhance the economic return of additional SSS projects.

Expanding SSS Research to Include Other Outcomes and Measures

This study only examined SSS projects that produced graduation rates that exceeded the national average for LIFG students and only looked at one outcome for SSS participants: higher graduation rates. However, SSS participants are more likely to remain enrolled in higher education, accrue more college credits, and earn higher grade point averages when compared to similarly qualified students who did not participate in the program (Chaney et al., 1997). These outcomes are all positive results of SSS participation so future studies could include these outcome measures.

In addition to benefits to the federal government, future studies could be expanded to include benefit measures such as state and local income tax, property taxes, health care savings beyond those offered by Medicaid, and crime costs that exceed the savings from federal incarceration alone. Including individual state costs could provide these SSS projects leverage when requesting state funds. This data, combined with national statistics that indicate that if the United States does not increase education levels, individual incomes will be depressed and create a corresponding decrease in the nation's tax base (Kelly, 2005) should provide a cogent argument for the continued funding of the SSS program and others like it that focus on LIFG students.

This study could also be expanded to include the benefits and costs of SSS to the individual. Costs to the individual, such as volunteer time and transportation (King, 1994), and opportunity costs of staying in school and not working are not included in this study but could be included in future studies of SSS. In addition, benefits to the individual may be a worthwhile area to explore, because information contained in Table 34 indicates that the investment in SSS also has a substantial return for the individual:

Table 34
Financial Benefits Experienced by SSS Participants in Higher-impact SSS Projects Who Graduate from College at a Higher Rate due to SSS Participation

Age	Income of Student with Some College, No Degree	Income of Student Who Earns a Bachelor's Degree
25-29 years	$31,786	$41,593
30-34 years	$31,786	$41,593
35-39 years	$38,901	$54,803
40-44 years	$38,901	$54,803
45-49 years	$40,921	$57,358
50-54 years	$40,921	$57,358
55-59 years	$40,222	$51,684
60-64 years	$40,222	$51,684
TOTAL	**$1,518,300**	**$2,054,380**

At a graduation rate of 36.6%, the smallest graduation rate increase studied in this analysis (2.5% above the national average of 34.1%) out of 120 participants, 3 additional participants would graduate (120 x 2.5%) and these three graduates would make $536,080 more over their working life than they would have did they not graduate. This additional income would come from a federal investment of $9,628 per graduate, which equals a $28,884 investment ($9,628 multiplied by 3 graduates) for a return of $1,608,240 ($536,080 multiplied by 3 graduates). It is clear that the investment in SSS can have a substantial return for the individual. This sort of information could provide practitioners recruiting for SSS an important tool that could serve as a motivator for SSS participation by students who qualify for the program.

Finally, while many of the outcomes of SSS are too intangible to be measured in a cost analysis of the program, future studies should carefully evaluate if other outcomes of

SSS can be monetarily valued and used in future benefit-cost analyses of the SSS program. While this study produces tangible results, a cost analysis of SSS that was able to focus on more SSS outcomes would result in more robust results and a more comprehensive benefit-cost analysis of the SSS program.

In addition to outcomes that can be measured on a benefit-cost continuum, policymakers may, and some would argue should, consider other societal outcomes such as equity. If a program has benefits that exceed its costs, yet it decreases equity within society, this should be considered in an evaluation of the program. The benefits produced by the program may be outweighed by the losses of equity within society, assuming that equity is a goal of policymaking. There may also be ethical considerations to policymaking. A program may have a goal of increasing access to college, but if the results of the program do not meet this goal, it may be deemed as unethical. For example, a June 2000 lawsuit filed by the American Civil Liberties Union against the State of Michigan alleged that a Michigan Merit Award Scholarship Program "violated the civil rights of minority and economically disadvantaged students through the use of scholarship criteria that are not educationally defensible" (Heller, 2002, p. 68).

Expanding the Benefit-Cost Analysis of SSS through Improved Data

Another way to get a clear picture of the benefits-costs of the SSS program is to improve the data available on SSS participant outcomes. Federal, state and local officials need to acquire more accurate measures of the program's effect on retention, credits earned, GPA and graduation rates. A current limitation of demonstrating the effectiveness of an SSS project is that tracking graduation rates is extremely difficult when SSS participants transfer from one institution to another. Transfer is a common

occurrence, especially going from 2-year to 4-year schools. Once a student leaves an institution, it is hard to track his or her future graduation (Chaney et al., 1998). Furthermore, SSS participants are a fairly mobile population. One-quarter of SSS participants are not in school in the third year, and an additional 26 percent have attended more than one institution (Muraskin, 1997, p. 6). As a result, the recorded graduation rates of SSS participants may be lower than actual graduation rates for SSS participants because many students who leave their institutions without graduating eventually graduate from a different institution (Muraskin, 1997).

Fortunately, tracking graduation rates of a mobile population may become less cumbersome in the future. One possibility for tracking students would be to establish a national database by connecting state databases that contain information on nearly 70 percent of the nation's full-time college enrollment (Ewell, Schild & Paulson, 2003, Tinto, 2004). Another option, recommended by the Secretary Spellings' Educations Commission on the Future of Higher Education, is to create a database based on Department of Education financial aid data. Using financial aid data would make it possible to follow students from one institution to the next.

Greater Use of Cost Analysis in Education Research

Although the federal government has funded the SSS program for nearly 40 years, researchers had not conducted a benefit-cost analysis of the program. This study will add to existing literature about the SSS program by providing information about the benefits and costs of the program and the financial return on an investment in SSS.

Education researchers can use this study as a starting point for increased benefit-cost analysis of programs that help to improve college access and success for students

who most need assistance. This analysis can be used as a starting point for "unpacking the box" to determine what elements of this program and others like it are most consistently responsible for LIFG student success. Finally, this study can be used as a catalyst for more and better cost analysis of education programs. I gathered data in 2001 for a study documenting that cost analysis was woefully absent in much of education policy research (Rice, 2002) and today, that landscape of education policy research has not changed very much in regard to the use of cost analysis. My research for this study confirmed that cost analysis is still not frequently used in the evaluation of education policies or programs. This study will serve as a catalyst for greater use of cost analysis by education researchers and practitioners in the future. As the competition for government resources increases, cost analysis can help to ensure that policymakers and lawmakers are aware of which programs produce a return on investment.

The Advocate as Analyst

As previously mentioned, the role of the author as an employee of the Department of Education has required extra attention to the need of delivering a reasonably unbiased benefit-cost analysis of the SSS program. Due to the fact that billions of dollars have been invested in the SSS program by the federal government over the last 40 years, and the author is an employee of the federal government, there may have been some inherent pressure to produce a positive measure of benefits when compared to costs. In addition, the fact that the author has conducted on-site reviews of many SSS projects and has seen first-hand the positive impacts of SSS projects on students, may also have led to a bias that would produce a positive evaluation of the SSS program.

To combat the inherent bias that may exist due to the relationship of the author to the program being evaluated, several things were done. First, the author chose a methodology for the study that was utilized in other benefit-cost analyses of education programs and is widely held as the standard for educational benefit-cost analyses. Second, the author worked to maintain an open mind about the fact that although this program produced a positive benefit-cost ration, there may be other programs out there that are producing better results such as higher graduation rates for the participants they serve. Third, the author ensured that there was no review by Department of Education staff, removing political pressure to guide the research in a direction that may have been beneficial to the Department of Education, but may have compromised the independence of the research and analytical process. Fourth, there was no financial benefit to be gained by the author from conducting this study. Therefore, even indirect financial pressures were removed from this study (Worthen & Sanders, 1987). Therefore, distortions resulting from the author's perception of possible payoffs or penalties" (Worthen & Sanders, p.289) were not a concern. Fifth, the author maintained a position within the organizational hierarchy of the Department that allowed for contact with TRIO programs such as SSS, yet, his employment and performance appraisals were conducted by Department managers not involved with the administration of the SSS program, or any other federal grant programs. Finally, because benefit-cost analysis can feed decisionmaking, and therefore its results can enter the political arena (Weiss, 1975), the author made several attempts throughout this analysis to caution those who read it that benefit-cost analysis should be one of many criterion used when considering future

funding for a program. It should be one of many criterion used in a multi-faceted review of a program such as SSS.

Final Thoughts

This study has demonstrated that for one outcome of SSS, increased college graduation rates, it is possible to conduct a benefit-cost analysis and compare monetary benefits and costs of the SSS program. Furthermore, the results of this benefit-cost analysis are consistent with findings from other benefit-cost analyses of education programs. Studies of the First Things First (Belfield & Levin, 2007) program, Chicago Parent-Child Centers (Temple & Reynolds, 2005) the Perry Pre-School Program (Barnett, 1996; Schweinhart et al., 2005) and the Abecedarian program (Barnett & Masse, 2005) have all produced benefits that exceed their costs. This study, using benefits measures that are more conservative than benefits measures used in the studies listed above, still produced benefits that far exceed the costs of the program. Even with these conservative estimates, one could cut the benefits measures in half, and the benefits would still exceed the costs of these higher-impact SSS projects across every graduation rate and at every discount rate. Little doubt remains that these projects generate a positive economic return to society.

Why is the economic return so important? If current laws and practices continue, health care spending is expected to reach $4.4 trillion and comprise over one-fifth of Gross Domestic Product (GDP) (Centers for Medicaid and Medicare Services, 2009). By the year 2030, when baby boomers are entering their seventies and eighties, health care spending could reach $16 trillion (Burner & Waldo, 1992). Just these statistics alone indicate that the competition for federal dollars will increase as entitlements such as

Medicare and Medicaid increase significantly in the coming years. In this competitive environment, lawmakers and policymakers will be looking for programs that generate an economic return to society. The SSS program, by building on this benefit-cost analysis, can strategically position itself to demonstrate the economic benefits of its projects across the United States.

While recognizing the economic benefits of SSS and other programs like it is important, it should not be the only measure for success of a program. Many indirect benefits to SSS participation and subsequent college graduation that are not easily measured are important. Participating in SSS and graduating from college can result in the participant acting as an informal teacher to others, thus increasing others' productivity and their contribution to the economy through the diffusion of new technologies (Psacharopoulos, 1972; Bowen, 1997; IHEP, 1998). In addition, evidence indicates that having a college degree increases one's tolerance for varied political views, and decreases forces of racial prejudice and bigotry and produces a more informed electorate (Trow, 1970; Bowen 1997; IHEP, 1998). Another indirect benefit of higher education is that college graduates fill some of the most important positions in our society as teachers, doctors, nurses, ministers, social workers and public servants and by virtue of that can have a greater impact on society (Ashby, 1976; Bowen, 1997). For example, people with a college education are more likely to participate in governance, devote time and money to community service, and contribute more to economic growth and productivity (Institute for Higher Education Policy, 1998; Tinto, 2004). Although these secondary benefits of education exist, no way of quantifying them accurately currently exists. As a result, they were not included in this analysis. However, in our focus on economic

benefits, it is critical to always recognize those benefits that although non-monetary, are very important.

In the United States, education has often been hailed as the "great equalizer" and a means of blurring, if not erasing, social differences (Bowen, 1997, p.326). To the extent that the SSS program helps higher education be a great equalizer through its focus on LIFG students, the program does a good for the individual (its participants) and a good for society. These goods are both economic (as demonstrated by this benefit-cost analysis) and egalitarian in that they support a more even distribution of income. As we look forward, the wise policymaker will promote policies that consider, "the needs of all people for equity, participation, respect, challenge, and personal growth" (Campbell, Converse & Rodgers, 1976, p. 2; Bowen, 1997, p. 282). Higher education is still one of the most reliable routes to achieving those ideals.

From a public policy perspective, the SSS projects that are the focus of this study would have been considered winners had they simply broken even. That is to say, "public policy does not assume a profit margin on public spending in order to make the investment in the first place" (Villar & Strong, 2007, p. 16), especially when investing in a program that targets low-income and first generation college students, a growing population in this country that is critical to the nation's future economic competitiveness in the global marketplace. The generally strong positive results from SSS and other education programs provide reason to believe that these programs yield high returns to society (Levin et al., 2006). For this reason alone, the SSS program or any other program that targets resources to low-income and first generation students should be considered for funding by federal, state and local governments.

APPENDIX A: Low-Income Student Levels

In 2005 those levels were as follows:

Size of Family Unit	48 Contiguous States, D.C. and Outlying Jurisdictions	Alaska	Hawaii
1	$14,355	$17,925	$16,515
2	$19,245	$24,045	$22,140
3	$24,135	$30,165	$27,765
4	$29,025	$36,285	$33,390
5	$33,915	$42,405	$39,015
6	$38,805	$48,525	$44,640
7	$43,695	$54,645	$50,265
8	$48,585	$60,765	$55,890

For families with more than 8 members, the following amount is added for each additional family member: $4,890 for the 48 contiguous states, the District of Columbia and outlying jurisdictions; $6,120 for Alaska; and $5,625 for Hawaii (http://www.ed.gov/print/about/offices/list/ope/trio/2005-low-income.html, 5/12/2008).

APPENDIX B: Discount Rate Demonstration

Discount Rate Demonstration Using a Discount Rate of 10%

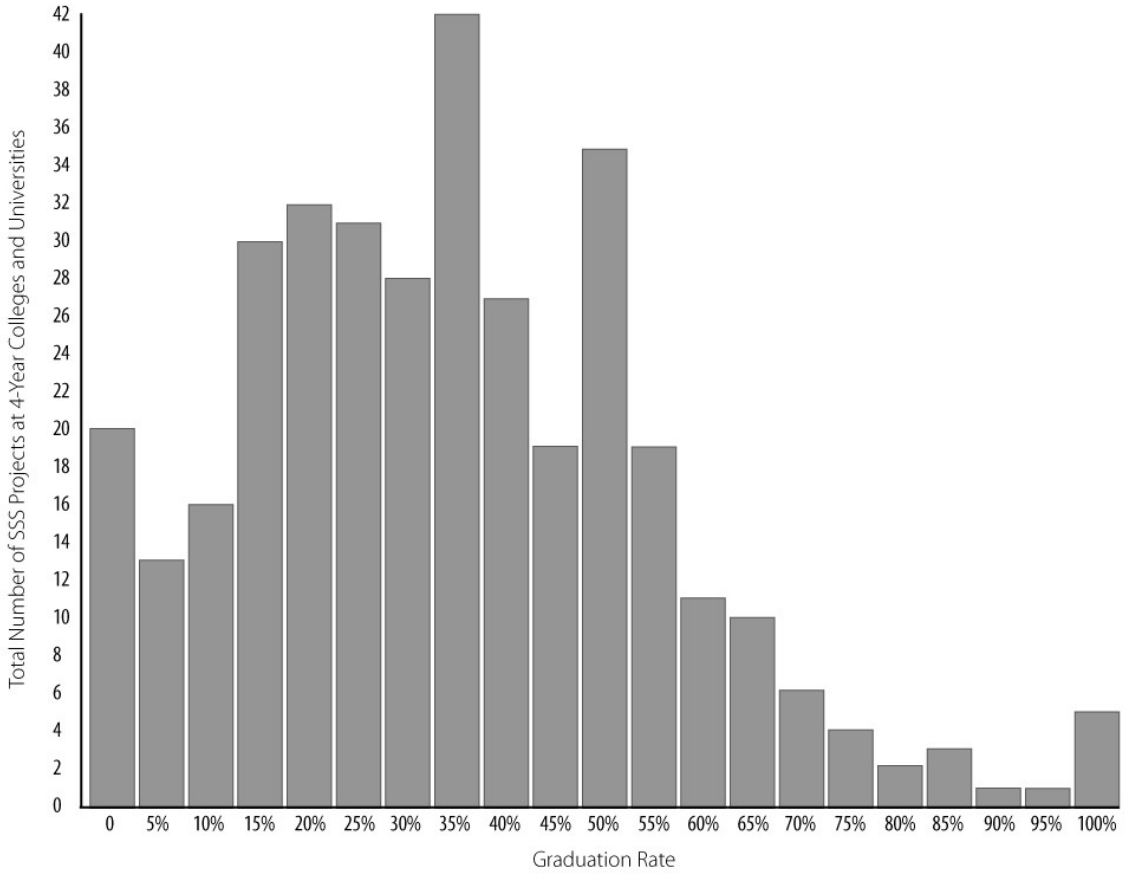
Year				
1	2	3	4	5
$\frac{\$1,000}{(1 + 10)^1}$	$\frac{\$1,000}{(1 + 10)^2}$	$\frac{\$1,000}{(1 + 10)^3}$	$\frac{\$1,000}{(1 + 10)^4}$	$\frac{\$1,000}{(1 + 10)^5}$
= $909.09	= $826.45	= $751.32	= $683.01	= $620.92

Source: (Rossi, Lipsey & Freeman, 2004, p. 358).

The table above uses a discount rate of 10%, a beginning dollar value of $1,000 and a time period of 5 years.

APPENDIX C: HISTOGRAM OF SSS PROJECT GRADUATION RATES AT 4-YEAR COLLEGES AND UNIVERSITIES

PROJECT YEAR 2005-2006



REFERENCE LIST

Alon, S. (2003). Model misspecification in assessing the impact of financial aid on academic outcomes. *Research in Higher Education*, *46*(1), 109-125

Altbach, Philip G., Berdahl, Robert O., & Gumport, Patricia J. *American Higher Education in the Twenty-First Century: Social, Political and Economic Challenges.* Baltimore: The Johns Hopkins University Press.

Anderson, D. (1999). The Aggregate Burden of Crime. *Journal of Law and Economics,* Volume 42, No. 2, pp. 611-642.

Anderson, E. & Cook, B. (2008). Access to Post-secondary Education in the United States: Past, Present and Future Perspectives. *OECD Centre for Educational Research and Innovation, 1,* 173-198.

Arete Corporation (2001). *I Have A Dream: The Impacts.* New York, NY: James Meier.

Arrow, K. J. (1973). Higher Education as a Filter. *Journal of Public Economics*, *2*(3), 193-216.

Ashby, E. (1976). A Case for More Mass Education. *London Times Higher Education Supplement,* January 23, 5.

Ashdown, Jane & Hummel-Rossi, Barbara (2002). What is Cost-Effectiveness Analysis? *Journal of Reading Recovery,* Fall, 44-46.

Bailey, B. (2005). Impact of the West Virginia University Student Support Services/TRIO Program from 1998 – 2004. *Proquest Information and Learning Company,* (UMI No. 3170907).

Barnett, S.W. (1985). Benefit-Cost Analysis of the Perry Preschool Program and its Policy Implications. *Educational Evaluation and Policy Analysis, 7*, 333-342.

Barnett, W.S., and Masse, L.N. (2007). Comparative benefit-cost analysis of the Abecedarian program and its policy implications. *Economics of Education Review, 26,* 113-125.

Barrow, L., and Rouse, C.E. (2005). Does College Still Pay? *The Economists' Voice 2,*(4), 1-8.

Baum, S., Payea, K., & Steele, P. (2006). *Education Pays – Second Update: A Supplement to Education Pays 2004: The Benefits of Higher Education for Individuals and Society.* Washington, DC: The College Board.

Becker, G. (1964). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education.* Chicago: The University of Chicago Press.

Becker, G. (1993). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education.* Chicago: The University of Chicago Press.

Belfield, C. & Levin, H. (2007). *The Price We Pay: Economic and Social Consequences of Inadequate Education.* Washington, DC: The Brookings Institution Press.

Bickman, L. (2000). *Validity and Social Experimentation, Donald Campbell's Legacy, Volume 1.* Thousand Oaks, CA: Sage.

Boesel, D. & Fredland, E. (1999). College for All? Is There Too Much Emphasis on Getting a 4-Year College Degree? *U.S. Department of Education, National Library of Education* (ERIC No. ED431986).

Bowles, S., Gintis, H., & Groves, M. (2005). *Unequal Chances: Family Background and Economic.* Princeton, NJ: Princeton University Press.

Belfield, C., Nores, M., Barnett, S., & Schweinhart, L. (2006). The High/Scope Perry Preschool Program: Cost-Benefit Analysis Using Data from the Age 40 Followup. *The Journal of Human Resources* XLI, 162-190.

Borger, C., Smith, S., Truffer, C., Keehan, Sisko, Poisal, & Klemens (2006). Health Spending Projections through 2015: Changes on the Horizon. *Health Affairs. 25*(2) 61-73.

Borman, Geoffrey D., & Hewes, Gina M., "The Long-Term Effects and Cost-Effectiveness of Success for All" *Educational Evaluation and Policy Analysis,* Volume 24, Issue 4, pp. 243 – 267.

Boughan, Karl (1996). The Academic Impact of Student Support Services Program Participation in Fiscal Year 1996 – Program Evaluation. *Prince George's Community College, Office of Institutional Research and Analysis,* 1-11.

Bowen, H.R. (1997). *Investment in Learning: The Individual and Social Value of American Higher Education.* Baltimore: The Johns Hopkins University Press.

Breneman, D. (1991). *Guaranteed Student Loans: Great Success or Dismal Failure?* Indianapolis, IN: United State Aid Fund.

Bureau of Justice Statistics. (2002a). *Criminal Victimization in the United States* Washington, DC: U.S. Department of Justice.

Bureau of Prisons. (2009) *Quick Facts about the Bureau of Prisons* Retrieved March 29, 2009 from http://www.bop.gov/news/quick.jsp#2

Burkheimer, G.J. & Davis, J.A. (1973) A Census of Special Support Programs for Disadvantaged Students in American Institutions of Higher Education, 1971-1972. *Educational Testing Service,* Princeton, NJ. (ED No. 112791).

Brewer, D.J., Krop, C., Gill, B.P., & Reichardt, R. (1999). Estimating the Cost of National Class Size Reductions under Different Policy Alternatives. *Educational Evaluation and Policy Analysis, 21*(2), 179-182.

Bureau of Labor Statistics (BLS) (1993). Labor Composition and U.S. Productivity Growth, 1948-90. *Bulletin 2426* Washington, DC: U.S. Department of Labor.

Bureau of Labor Statistics (n.d.). "Consumer Expenditures in 1995" Summary of Data from 1995 Survey, Retrieved February 22,2009 from http://www.stats.bls.gov

Burner, S.T., Waldo, D.R., and McKusick, D.R., (1992). National Health Care Expenditures Projections Through 2030. *Health Care Financing Review* 14(1): 1-29.

Cabrera, A.F., La Nasa, S.M., and Burkum, K.R. (2001). *On the Right Path: The Higher Education Story of One Generation.* Center for the Study of Higher Education, University Park, PA: The Pennsylvania State University.

Cahalan, M., Chaney, B., Chen, S., & Goodwin, D. (1994) National Study of SSS Interim Report: Volume 2 – Profile of Freshman Participants and Project Services: 1991-92. Washington, DC: *U.S. Department of Education*, Office of the Undersecretary.

Cahalan, M., Muraskin, L., & Goodwin, D. (1994). National Study of Student Support Services Interim Report: Volume 1 – Program Implementation. U.S. Department of Education, Office of the Under Secretary (ED 370 512).

Cain, G. (1968). *Benefit-Cost Estimates for Job Corps.* University of Wisconsin: Madison.

Card, D. (1999). The Causal Effect of Education on Earnings. *Handbook of Labor Economics,3*(30), 1809 – 1863.

Carey**,** N., Cahalan, M.W., Cunningham, K., & Agufa, J. (2004). *A Profile of the Student Support Services Program: 1997-98 and 1998-99, with Select Data from 1999-2000.* Washington, DC: U.S. Department of Education.

Carnevale, A. (2008). College for All? *Change 40*(1), 22-31.

Carnevale, A., & Rose, S. (2004). Socioeconomic Status, Race/Ethnicity, and Selective College Admissions. *In America's Untapped Resource: Low Income Students In Higher Education.* New York: The Century Foundation Press.

Carniero, P., & Heckman, J.J. (2004). Human Capital Policy. In J.J. Heckman and A.B. Krueger (Eds.) *Inequality in America: What role for human capital policies?* Cambridge, MA: MIT Press.

Centers for Medicare and Medicaid Services (2009). Health Care Spending Projections. Retrieved on April 4, 2009 from www.cms.hhs.gov.

Chaney, B., Muraskin, L., Cahalan, M., and Rak, R. (1997). Third-Year Longitudinal Study Results and Program Implementation Study Update, National Study of Student Support Services, Washington, DC: U.S. Department of Education.

Chaney, B., Muraskin, L., Cahalan, M,. and Goodwin, D. (1998). Helping the Progress of Disadvantaged Students in Higher Education: The Federal Student Support Services Program *Educational Evaluation and Policy Analysis,20*(3), 197-215.

Chevalier, A., Harmon, C., Walker, I., Zhu, Y. (2003). *"Does Education Raise Productivity, or Just Reflect It?*" Working Paper Series - Center for Economic Research, Department of Economics, University College, Dublin.

Clune, William H. (2002). Methodological Strength and Policy Usefulness of Cost-Effectiveness Research. *2002 Yearbook of the American Education Finance Association,* Larchmont, NY: Eye on Education.

Cook, Thomas D., Murphy, Robert F., and Hunt, H. David. (2000). Comer's School Development Program in Chicago: A Theory-Based Evaluation. *American Educational Research Journal*, *37*(2), 535-597.

Cook, B. & King, J. (2004). Low-Income Adults in Profile: Improving Lives Through Higher Education. Washington, DC: American Council on Education.

Coulson, J.E., & Bradford, C. (1983). *Evaluation of the Special Services for Disadvantaged Students (SSDS) program: Final Report.* Santa Monica, CA: Systems Development Corporation. (ERIC Document Reproduction Service No. ED 338 941).

Davis, J.A., Burkheimer, G., & Borders-Patterson, A. (1975). *The Impact of Special Services Programs in higher education for "disadvantaged" students.* Princeton, NJ: Educational Testing Service. (ERIC Document Reproduction Service No. ED 112 790).

Douglass, G.K. (1977). Economic Returns on Investments in Higher Education In *Investment in Learning* Washington, DC: Jossey-Bass Publishers.

Dynarski, S. (2005). Building the Stock of College-Educated Labor *Working Paper 11604,* Cambridge, MA: National Bureau of Economic Research (www.nber.org/papers/11604).

Engle, J., Bermeo, A., & O'Brien, C. (2006). *Straight from the Source: What Works for First-Generation College Students.* Washington, DC: The Pell Institute for the Study of Opportunity in Higher Education.

Engle, J. & Tinto, V. (2008). *Moving Beyond Access: College Success for Low-Income, First Generation Students.* Washington, DC: The Pell Institute for the Study of Opportunity in Higher Education.

Everything2.com (n.d.). Screening versus Human Capital. Retrieved on June 5, 2009 from www.everything2.com.

Erisman, W. & Contardo, J.B. (2005). *Learning to Reduce Recidivism: A 50-state analysis of postsecondary correctional education policy.* Washington, DC: Institute for Higher Education Policy.

Ewell, P., Schild, P., & Paulsen, K. (2003). *Following the Mobile Student.* Lumina Foundation for Education Research Report, Indianapolis, IN: Lumina Foundation for Education.

Field, Kelly (2008). Education Department to End Controversial Study of Upward Bound *The Chronicle of Higher Education, 54*(26).

Fletcher, J.D., Hawley, David E., & Piele, Philip K. (1990). Costs, Effects, and Utility of Microcomputer Assisted Instruction in the Classroom. *American Educational Journal*,*27*(4), 783-806.

Freeman, Richard (1976). *The Overeducated American.* New York: Academic Press.

Furey, S. (2008). *TRIO Promising and Innovative Practices Studies: Final Report on Promising and Innovative Practices Among SSS Program Grantees*. Washington, DC U.S. Department of Education.

Garms, Walter I. (1971). A Benefit-Cost Analysis of the Upward Bound Program. *The Journal of Human Resources, 6*,(2) 206-220.

Gladieux, L. (2004). Low-Income Students and the Availability of Higher Education. in *America's Untapped Resource: Low Income Students in Higher Education,* Ed. Richard Kahlenberg, New York: The Century Foundation Press.

Gladieux, L. and Perna, L. (2005). *Borrowers Who Drop Out: A Neglected Aspect of the College Student Loan Trend.* Washington, DC: The National Center for Public Policy and Higher Education.

Glenn, D. (2007). Education Researchers and Policy Makers Not in Sync, Scholars Say. *The Chronicle of Higher Education, 53*(39), A11.

Goodman, J. (1979). The economic returns of education: An assessment of alternative models. *Social Science Quarterly 60*, 269-283.

Green, D. (2007). A Cautionary Discussion about Relying on Human Capital Policy to Meet Redistributive Goals. *Canadian Public Policy – Analyse de Politiques,33,*(4), 397-418.

Groutt, J. (2003). Milestones of TRIO History, Part 1. *Opportunity Outlook,* January, 1-7.

Hanushek, E.A. (1989). The Impact of Differential Expenditures on School Performance. *Educational Researcher, 18*(4), 45-51, 62.

Hanushek, E.A. (1994). Money Might Matter Somewhere: A Response to Hedges, Laine, and Greenwald. *Educational Researcher,* 23, 5-8.

Harlow, C.W. (2003). Education and Correctional Populations. *Bureau of Justice Statistics Special Report,* January, 1-12.

Haveman, R. & Smeeding, T. (2006). The Role of Higher Education in Social Mobility. *The Future of Children, 16*(2), 125-150.

Heckman, J. & Krueger, A. (2005). *Inequality in America: What Role for Human Capital Policies?* Cambridge, MA: MIT Press.

Hedges, L.V., Laine, R.D., & Greenwald, R. (1994). Does Money Matter? A Meta-Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes. *Educational Researcher,* 23, 5-14.

Heller, D. (2002). *Condition of Access: Higher Education for Lower Income Students.* Westport, CT: Praeger Publishers.

Henry, M.J. (1999). A Cohort Evaluation of the Effectiveness of the Student Support Services Program at Southwest Virginia Community College. *Bell & Howell Information and Learning Company* (UMI No. 9978797).

Higher Education Act of 1965, Section 402D.20 U.S.C. 1070a-14 Student Support Services.

House, Ernest R. (1988). Methodology and Justice. *New Directions for Program Evaluation,(45),* 23-36.

Hoyle, J. & Kutka, T. (2008). Maintaining America's Egalitarian Edge in the 21st Century: Unifying K-12 and Postsecondary Education for the Success of All Students *Theory Into Practice, 47*(4), 353-362.

Hughes, T. (2006). *National Corrections Reporting Program*. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics.

Hummel-Rossi, Barbara & Ashdown, Jane (2002). The State of Cost-Benefit and Cost-Effectiveness Analyses in Education. *Review of Educational Research,72*(1) 1-30.

Institute for Education Sciences, (2008). *Trends in Undergraduate Borrowing II: Federal Student Loans in 1995-96, 1999-2000 and 2003-04.* U.S. Department of Education, NCES, 2008-179.

Institute for Higher Education Policy (1998). *Reaping the Benefits – Defining the Public and Private Value of Going to College.* Washington, DC: The New Millenium Project on Higher Education Costs, Pricing and Productivity.

Jaschik, Scott (2005). First Generation Challenges. *Inside Higher Ed,* August 10.

Johnson, Lyndon Baines (1964). State of the Union Address. Retrieved on February 5, 2008 at http://janda.org/politxts/State%20of%20Union%20Addresses/1964-1969%20Johnson/LBJ.64.html

Kaiser (2009). State Health Facts. *The Henry J. Kaiser Family Foundation.* Retrieved March 22, 2009 from www.statehealthfacts.org.

King, Jennifer A. (1994). Meeting the Educational Needs of At-Risk Students: A Cost and Analysis of Three Models. *Educational Evaluation and Policy Analysis, 16,*(1), 1-19.

Kirsch, I., Braun, H., Yamamoto, K., & Sum, A. (2007). *America's Perfect Storm: Three Forces Changing Our Nation's Future.* Princeton, NJ: Education Testing Service, Policy Information Center.

Krause, S. (2007). A Case Study of TRIO SSS Programs for Non-Traditional Students at Selected Midwestern States. *Proquest Information and Learning Company,* (UMI No. 3284744).

Krueger, A. (2005). Inequality, Too Much of a Good Thing. In *Inequality in America, Too Much of a Good Thing,* Cambridge MA: The MIT Press.

Lederman, D. (2007). Lifeline to Low-Income Students. *Inside Higher Ed,* Retrieved February 20, 2007: http://insidehighered.com/news/2007/02/20/fafsa.

Leech, N. & Onwuegbuzie, A.J. (2004). A Proposed Fourth Measure of Significance: The Role of Economic Significance in Educational Research. *Evaluation and Research in Education 18*(3) 179-198.

Leslie, L. & Brinkman, P. (1988). *The Economic Value of Higher Education.* New York, NY: The American Council on Education, Macmillan Publishing Company.

Levin, Henry M. (1988). Cost-Effectiveness and Educational Policy. *Educational Evaluation and Policy Analysis, 10*(1), 51-69.

Levin, Henry M. (2001). Waiting for Godot: Cost-Effectiveness Analysis in Education. *New Directions for Evaluation, 90*, 55 – 67.

Levin, Henry M. & McEwan, Patrick J. (2001). *Cost-Effectiveness Analysis: Methods and Applications.* Thousand Oaks, CA: Sage Publications.

Levin, Henry M. & McEwan, Patrick J. (2002). Cost-Effectiveness and Educational Policy. *2002 Yearbook of the American Education Finance Association,* Larchmont, NY: Eye on Education.

Levin, H., Belfield, C., Muennig, P. & Rouse, C. (2006). The Costs and Benefits of an Excellent Education for America's Children. New York, NY: Working Paper, Teachers College, Columbia University.

Lipsey, M.W. (1993). Theory as Method: Small Theories as Treatments. *New Directions for Program Evaluation, 57*, 5-38.

Lochner, L. & Moretti, E. (2008). The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports. *The American Economic Review, 94*, 155-189.

Longanecker, D. (2008). *A Tale of Two Pities: The Story of Public Higher Education Finance in the United States.* Western Interstate Commission for Higher Education Boulder, CO.

Mahan, C.A. (2001). Student Support Services: The Impact the Frequency of Services Has on the Retention and Graduation Rates of White and Students of Color. *Bell & Howell Information and Learning Company,* (UMI No. 3016728).

Mahoney, Robert G. (1998). Components of TRIO's Success: How One Student Support Services Program Achieved Success. *Journal of Negro Education, 67*(4), 381 – 388.

Medical Expenditure Panel Survey (2006). *Total Health Services –Mean and Median Expenses per Person with Expense and Distribution of Expenses by Source of Payment.* Washington, DC: Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality.

Miller, M. (2007). *2005-2006 Federal Pell Grant Program End-of-Year Report.* Washington, DC: U.S. Department of Education, Office of Postsecondary Education.

Moltz, D. (2009). Competing Completion Initiatives. *Inside Higher Ed* www.insidehighered.com, May 5.

Monk, D.H. (1990). *Educational Finance: An Economic Approach.* New York: Mc-Graw Hill.

Monk, D.H. & King, J.K. (1993). Cost Analysis as a Tool for Education Reform. In S.L. Jacobson & R. Berne (Eds.), *Reforming Education: Yearbook of the American Education Finance Association.* Thousand Oaks, CA: Corwin.

Moore, M., Boardman, A., Vining, A., Weimer, D., & Greenberg, D. (2004). Just Give Me a Number! Practical Values for the Social Discount Rate. *Journal of Policy Analysis and Management, 23*(4), 789-812.

Mortenson, T. (2008). Family Income and Higher Education Opportunity – 1970 – 2006. *Postsecondary Education Opportunity,* Issue 192, 1-16.

Mortenson, T. (2007). Private Correlates of Educational Attainment. *Postsecondary Education Opportunity,* November.

Mortenson, T. (2004). Federal Individual Income Taxes Paid by Educational Attainment – 1970 – 2004. *Postsecondary Education Opportunity,* 12-16.

Mortenson, T. (2003). Family Income and Higher Education Opportunity – 1970 – 2003. *Postsecondary Education Opportunity,* 1-10.

Mortenson, T. (1996). Federal Income Taxes Paid by College Educated Taxpayers. *Postsecondary Education Opportunity,* July.

Muennig, P. (2007). Consequences in Health Status and Costs. in *The Price We Pay, ed. Belfield, C. and Levin, M.,* Washington, DC: Brookings Institution Press.

Muraskin, L. (1997). *Best Practices in Student Support Services: A Study of Five Exemplary Sites. Follow Up Study of Student Support Services Programs.* Washington, DC: U.S. Department of Education.

Murray, C., Goldstein, D.E., Nourse, S., & Edgar, E. (2000). The postsecondary school attendance and completion rates of high school graduates with learning disabilities. *Learning Disabilities Research & Practice, 15*(3), 119-127.

Murphy, K. & Welch, F. (1989). Wage Premiums for College Graduates: Recent Growth and Possible Explanations. *Educational Researcher* 18, 17-27.

National Center for Children in Poverty (2006). *Basic Facts About Children in Poverty* New York, NY: Mailman School of Public Health, Columbia University, 1-4.

National Center for Education Statistics (2006). *Nontraditional undergraduates/trends in nontraditional student enrollment.* Retrieved on June 28, 2006 from http://nces.edgov/pubs/we/97578f.asp.

National Center for Public Policy and Higher Education (2005). *Policy Alert: Income of U.S. Workforce Projected to Decline if Education Doesn't Improve*. 1-8.

NCES. (2002). Digest of Educational Statistics. Retrieved at www.nces.ed.gov.

NCES (2003). *What Colleges Contribute: Institutional Aid to Full-Time Undergraduates Attending 4-Year Colleges and Universities.* Report 2003-157. Washington, DC: U.S. Department of Education, Institute of Education Sciences.

Ng, Y. (1983). *Welfare Economics.* New York, NY: Macmillan Publishing.

Nores, Milagros, Belfield, Clive R., Barnett, Steven W., Schweinhart, Lawrence (2005). Updating the Economic Impacts of the High/Scope Perry Preschool Program. *Educational Evaluation and Policy Analysis, 27*(3), 27, 245 – 261.

OECD (2008). *Higher Education to 2030 Volume 1: Demography*. France: OECD Publishing.

Office of Management and Budget (1972). OMB Circular A-94.

Office of Management and Budget (2008). OMB Circular A-94.

Pell Institute (2008). TRIO History. Retrieved March 29, 2008, from www.pellinstitute.org/clearinghousepublication.html.

Presman, Dylan (2006). *An Explanation of the Efficiency Measure.* Washington, DC: U.S. Department of Education.

Psacharopoulos, G. (1972). The Economic Returns to Higher Education in Twenty-Five Countries. *Higher Education 1*(2), 141-158.

Psacharopoulos, G. & Patrinos, H.A. (2002). Returns to Investment in Education: A Further Update. Washington, DC: *World Bank Policy Research Working Paper 2881*.

Pinkston-McKee (1990). Student Support Services Program. Washington, DC: U.S. Department of Education.

Potter, W. (2003). Best Programs for 'Early Intervention' Give Students More Than Money, Study Finds. *The Chronicle of Higher Education,* March 3, A22.

Prest, A. & Turvey, R. (1965). Cost Benefit Analysis, A Survey. *Economic Journal,* December.

Psacharopoulos, G. (1994). Returns to Investment in Education: A Global Update. *World Development, 22*(9), 1325-1343.

Rawls, J. (1971). *A Theory of Justice.* Cambridge, MA: The Belknap Press of Harvard University Press.

Read, S. (1982). *TRIO Special Services Program Evaluation*, University of Minnesota Final Report. ERIC Database (ED224418).

Reindl, T. (2007). Hitting Home: Quality, cost and access challenges confronting higher education today. Boston, MA: Jobs for the Future. Retrieved April 12, 2009, from http://www.jff.org/Documents/HittingHome.pdf

Reynolds, Arthur J., Temple, Judy A., Robertson, Dylan L., and Mann, Emily A. (2002). Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent Centers. *Educational Evaluation and Policy Analysis*, *24*(4), 267 – 303.

Rice, Jennifer King (1997). Cost Analysis in Education: Paradox and Possibility, *Educational Evaluation and Policy Analysis*, *19*(4), 309-317.

Rice, Jennifer (2002). Cost Analysis in Education Policy Research: A Comparative Analysis Across Fields of Public Policy. *Cost-Effectiveness of Educational Policy – 2002 Yearbook,* 21-36.

Rossi, Peter H., Freeman, Howard E., Lipsey, Mark W. (1999). *Evaluation: A Systematic Approach.* Thousand Oaks, CA: SAGE Publications.

Rossi, Peter H., Lipsey, Mark W., and Freeman, Howard E. (2004). *Evaluation: A Systematic Approach – 7th Edition,* Thousand Oaks, CA: Sage Publications.

Rubin, Robert E. (2006). We Must Change Policy Direction. *The Wall Street Journal,* January 26, p. A-20.

Rumbaut, Ruben G. (2006). The Making of People. In *Hispanics and the Future of America,* edited by Marta Tienda and Faith Mitchell, Washington, DC: National Academies Press, 16-65.

Schultz, T.W. (1972). *Investment in Education: The Equity-Efficiency Quandary.* Chicago, IL: The University of Chicago Press.

Schweinhart, L., Montie, J., Xiang, Z., Barnett, S.W., Belfield, C.R., & Nores, M. (2005). *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40.* Ypsilanti, MI: High/Scope Press.

Shaw, P. (1999). The Pareto Argument and Inequality. *The Philosophical Quarterly, 49*(196).

Sinden, J.A. (1980). Forum: Pangloss, Pandora and Pareto for the Aspiring Benefit-Cost Analyst. *Review of Marketing and Agricultural Economics, 48*, (2), 99 – 109.

Smith, A. (1776). *The Wealth of Nations* New York: Random House.

Snyder, T.D., Tan, A.G., Hoffman, C.M., (2004). Table 174. Total fall enrollment in degree-granting institutions, by attendance status, sex of student, and control of institutions: 1947 – 2001. *Digest of Education Statistics 2003,* Washington, DC: Department of Education, National Center for Education Statistics.

Spence, M. (1973). Job Market Signaling. *Quarterly Journal of Economics, 87*, 355-374.

Swail, W.S., Redd, K.W. and Perna, L.W. (2003). Retaining Minority Students in Higher Education: A Framework for Success *ASHE-ERIC Higher Education Report: Volume 30, Number 2.*

Swail, W.S. (2000). Preparing America's Disadvantaged for College: Programs that Increase College Opportunity. *New Directions for Institutional Research, 107*, 85 – 101.

(n.d.). *Student Support Services Program Annual Performance Report 2005-2006*. OMB Approval Number 1840-0525. Expiration Date: 11/30/2009.

Temple, Judy A., & Reynolds, Arthur J. (2007). Benefits and costs of investments in preschool education: Evidence from Child-Parent Centers and related programs. *Economics of Education Review, 26*, 126-144.

Thomas, Earl Preston, Farrow, Earl Vann & Martinez, Juan (1998). A TRIO Program's Impact on Participant Graduation Rates: The Rutgers University Student Support Services Program and Its Network of Services. *The Journal of Negro Education, 67*(4), pp. 389-403.

Thornton, C., Long, D., & Mallar, C. (1982). *A Comparative Evaluation of Benefits and Costs of Job Corps After 48 Months of Observation.* Princeton, NJ: Mathematica Policy Research.

Tinto, Vincent (2004). *Student Retention and Graduation: Facing the Truth, Living With the Consequences.* Washington, DC: The Pell Institute for the Study of Opportunity in Higher Education.

Trostel, Philip A. (2008). The Fiscal Impacts of College Attainment. *Margaret Chase Smith Policy Center and School of Economics.* Portland, ME: University of Maine.

Trow, M. (1970). Reflections on the Transition from Mass to Universal Higher Education. *Daedalus,* Winter, 1-42.

Truffer, C., Klemm, J., Hoffman, E. & Wolfe, C. (2008). *2008 Actuarial Report on the Financial Outlook for Medicaid.* Office of the Actuary, Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services.

Trumbull, W. (1990). Who Has Standing in Cost-Benefit Analysis? *Journal of Policy Analysis and Management, 9*(2), 201-218.

U.S. Current Population Survey (2006). *Earnings Gap Highlighted by Census Bureau Data on Educational Attainment.* Washington, DC: U.S. Census Bureau News, U.S. Department of Commerce.

U.S. Department of Education (2009). Office of Postsecondary Education, Office of the Executive Officer Data Report, Washington, DC.

U.S. Department of Education (2008). *TRIO Promising and Innovative Practice Studies: Final Report on Promising and Innovative Practices Among SSS Program Grantees.* Washington DC.

U.S. Department of Education (2008b). TRIO Data. Retrieved March 28, 2008, from www.ed.gov/programs/triostudsupp/funding.html.

U.S. Department of Education, (2006). *A Profile of Federal TRIO Programs and Child Care Access Means Parents in School Program.* Washington, DC.

U.S. Department of Education (2006). *A Test of Leadership: Charting the Future of U.S. Higher Education*. Washington, DC.

U.S. Department of Education, (2004). *Survey on Remedial Education in Higher Education Institutions.* Washington, DC.

U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, Office of Public Health and Science. (2001). *Healthy People in Healthy Communities: A Community Health Guide Using Healthy People 2010.* Washington, DC: Government Printing Office.

U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey (2006). *Table 1: Total Health Services - Median and Mean Expenses per Person with Expense and Distribution of Expenses by Source of Payment: United States, 2004*

U.S. Department of Justice (2008). Bureau of Justice Statistics. Retrieved May 20, 2008 from www.ojp.usdoj.gov/bjs/sent.htm.

Van Der Werfhorst, H. (2004). Productive Skills: Positional Good or Social Closure? Mechanisms for the Education Effect on Labour Market Outcomes. *Employ State-of-the-Art Report.* Amsterdam: AIAS-SCHOLAR.

Villar A. & Strong, M. (2007). Is Mentoring Worth the Money? A Benefit-Cost Analysis and Five-Year Rate of Return of a Comprehensive Mentoring Program for Beginning Teachers. *ERS Spectrum: Journal of Research and Information, 25*(3), 1-17.

Walsh, Julia (2000). Unique and Effective Practices for TRIO Student Support Services Programs. Kankakee, IL: Kankakee Community College.

Wei, C.C. & Berkner, L. (2008). Trends in Undergraduate Borrowing II: Federal Student Loans in 1995-96, 1999-2000, and 2003-04. *National Center for Education Statistics, Institute of Education Sciences,* Washington, DC: U.S. Department of Education (NCES 2008-179).

Weiss, C.H. (1975). Evaluation Research in the Political Context. In E.L. Struening & M. Guttentag (Eds.) *Handbook of Evaluation Research* (Volume 1). Beverly Hills, CA: Sage.

Witte, A.D. (1997). Crime. *The Social Benefits of Education* J. Behrman and N. Stacey, Eds., Ann Arbor, MI: University of Michigan Press, 219-246.

Wolff, E. (2002). *Top Heavy: The Increasing Inequality of Wealth in America and What Can Be Done About It.* New York: New Press.

Worthen, B. & Sanders, J. (1987). *Educational Evaluation: Alternative Approaches and Practical Guidelines.* White Plains, NY: Longman Press.

Yachnin, J. (2001). Hope Tax Credit Has Not Opened College to the Poor, Report Says. *The Chronicle of Higher Education,* May 25, p. A27.

Zhang, Y. & Chan, T. (2007). *An Interim Report on the Student Support Services Program: 2002-03 and 2003-04, With Select Data from 1998-2002.* Washington, DC: U.S. Department of Education, Office of Postsecondary Education.

Zhang, Y., Chan, T., Hale, M., & Kirshstein, R. (2005). *A Profile of the Student Support Services Program: 1998-1999 through 2001-2002.* Washington, DC: U.S. Department of Education.